Ugandan community health worker motivation: using the *Social Identity Approach* to explore an accepted constraint to scaled up health strategies

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I, Daniel Llywelyn Strachan confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

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ABSTRACT

(300 words)

The aim of this PhD is to understand what influences the work motivation of Ugandan community health workers (CHWs) using the Social Identity Approach (SIA); a social psychological theory. The SIA was chosen because it focuses on how group dynamics influence behaviours. Using the SIA heeds calls in the literature for improved social and contextual understanding of CHW work motivation and performance in order to guide development of more effective programmes.

In the PhD it is reported how two interventions aiming to improve CHW work motivation were developed based on qualitative, formative research data and the SIA. The first intervention utilised low cost mobile phones and the second community participatory groups. The interventions were tested as part of a larger study using a cluster randomised control trial (RCT) design. This required the development of valid CHW work motivation and social identification measurement scales. While the results of the RCT are not presented within this PhD, the development of the two scales and descriptive statistics of the quantitative measures are. Analyses of data generated through qualitative, cognitive interviews and quantitative scale development techniques are also included. The results of qualitative, associative interviews conducted with CHWs during intervention implementation are also presented. These interviews aimed to explore and explain the nature of the relationship between CHW work motivation and social identification and the influence on it of the two interventions measured during the trial.

This PhD demonstrates how the SIA can be used to understand the social and contextual influences on CHW work motivation and performance. This represents a new approach to developing effective CHW work motivation programmes. It has highlighted in particular the importance of distinguishing between *task based* and *extra role* performance motivation. Implications for programmes and researchers seeking to understand and influence CHW work motivation and performance are discussed.

IMPACT STATEMENT

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(497 words)

The primary aim of this PhD was to understand what influences Ugandan community health worker motivation. The secondary aim was to explore whether a social psychological theory, the Social Identity Approach, has the potential to inform effective strategies to improve this motivation. A range of knowledge, expertise, analysis skills and insights have been gained from the pursuit and achievement of these aims. This impact statement aims to illustrate the potential for these insights to be put to beneficial use, both in and outside academia.

This PhD has yielded several methodological insights. It has shown how local, contextual understanding can be incorporated into measurement scales. It did this by incorporating findings from qualitative research into scale item development. It has also shown how qualitative, associative interviews can be usefully utilised in conditions where social desirability bias may be anticipated. It did this by inviting Ugandan community health workers, known as village health team members or VHTs, to reflect on what they most associate with their work. In so doing it was able to elucidate their contextual priorities. Underscoring the importance of understanding the perspectives of the subjects of measurement scales, interventions and programmes emphasised elsewhere in the literature, is a key, transferable insight from the PhD.

The PhD has also yielded important empirical insights. It has demonstrated that VHTs are highly motivated according to estimates of VHT work motivation based on the developed VHT work motivation measurement scale. This result echoes those presented in other community health worker motivation studies. VHTs were also found to identify strongly with the VHT collective according to estimates of social identification based on the VHT social identification measurement scale. VHT work motivation and social identification were also found to have a strong, positive linear relationship. It was demonstrated that what ostensibly motivated VHTs are motivated to do is maintain their collective community standing through the pursuit of a range of activities they feel are essential to being effective as VHTs when drug supplies are unreliable; termed _extra role_ performance activities in the PhD. These findings provide lessons for those researching and developing community health worker strategies. In particular they highlight the need to challenge assumptions and problematize perceived links between community health worker motivation and performance through

improved local understanding. This PhD has demonstrated the important contribution the Social Identity Approach can make in support of this endeavour.

The insights described in this statement may be of relevance to all interested in the performance of community health workers in low-income settings. They may be of particular interest to those researching the effectiveness of scalable health strategies that rely on community health workers, especially those aiming to develop such programmes. These include but may not be limited to; academics and students interested in health systems, human resources for health and organisational psychology, representatives of private sector enterprise, and government and non-governmental workers and agencies. The findings will continue to be communicated in student seminars and lectures, conference presentations and peer reviewed journal publications.

ACKNOWLEDGEMENTS

My final vote of thanks is due to the respondents who have participated in this research, and in particular to the VHTs. You have allowed me a privileged insight into your lives and your candour has inspired me. My aim is to do justice to your generosity.

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LIST OF ACRONYMS

ASHA	Accredited Social Health Activists
CBA	Community Based Agent
CHW	Community Health Worker
CI	Confidence Interval
CIDA	Canadian International Development Agency
FA	Factor Analysis
FGD	Focus Group Discussion
FR	Formative Research
FW	Fieldworker
HBMF	The Home Based Management of Fever strategy
iCCM	Integrated Community Case Management
IDI	In Depth Interview
IGH	Institute for Global Health (at University College London)
inSCALE	The Innovations at Scale for Community Access and Lasting Effects project
LC1	Local Council Chairperson
LMICs	Low and Middle-Income Countries
LSHTM	The London School of Hygiene and Tropical Medicine
M	Mean
N	Sample size (full sample)
n	Sample size (sub-sample)
MoH	Ministry of Health
NGO	Non-Governmental Organisation
RCT	Randomised Control Trial
SCT	Social Categorisation Theory
SIA	The Social Identity Approach
SIT	Social Identity Theory
SD	Standard Deviation
SMS	Short Message Service
TASO	The AIDS Support Organization
UCL	University College London
UNICEF	The United Nations International Children's Emergency Fund

UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
VHC	Village Health Club
VHT	Village Health Team (NB: colloquially used as a term to describe both the team and individual team members)
WHO	World Health Organisation

PREFACE

The origins of this PhD lie in preliminary discussions about a new project in Kampala, Uganda held in the middle of 2010. As a consultant I was invited by colleagues at 'Malaria Consortium', an international non-governmental organisation, to research ways in which volunteer community health workers could be motivated at scale and low cost in Uganda and Mozambique. The brief, at the behest of the funder, the Bill & Melinda Gates Foundation, was to be innovative. I approached this challenge from a social psychological perspective given my academic background in that discipline. A quick examination of the literature revealed the absence of social psychological theory in what had been done to date. Thinking back to my previous studies, I recalled a theory that suggested that when people think as a member of a group they are motivated to maintain that group's positive image. I wondered whether stimulating an increased sense of group or team among community health workers could potentially lead to improvement in their motivation.

I introduced my Malaria Consortium colleagues to the Social Identity Approach and they encouraged me to pursue it. I was further emboldened by the support of the late Professor John Turner, who endorsed my application of the theory he was instrumental in developing with Henri Tajfel. Our proposal was successful and in early 2011 the Bill & Melinda Gates Foundation funded Innovations at Scale for Community Access and Lasting Effects project (inSCALE) began. The primary aim of the inSCALE project was to improve the community health worker delivered quality of care received by children below five for malaria, pneumonia and diarrhoea in Uganda and Mozambique. Secondary project aims were to improve the motivation, retention and performance of community health workers in the belief that improved quality of care would ultimately be the result.

At the commencement of the inSCALE project I joined University College London's Institute for Global Health (IGH). With Zelee Hill (originally my line manager and then, upon PhD commencement, also my PhD supervisor) I was tasked with building the evidence for the design of two interventions to improve the motivation, retention and performance of community health workers in Uganda and Mozambique. Harbouring the ambition to pursue a PhD I negotiated with inSCALE colleagues to establish how my proposed project could assist the achievement of inSCALE's secondary aims. This PhD, focused exclusively on community

health worker motivation in Uganda, is the result of that negotiation and subsequent work over seven years. Through that time the inSCALE project has been completed and I have maintained my research role at UCL's Institute for Global Health.

This PhD begins by examining the premise for a focus on the motivation of community health workers. It explains that the work done to date has mainly focused on the provision of incentives while a growing literature has called for increased consideration of contextual and community based motivational influences. The case for a strategy informed by the Social Identity Approach is made before the specific aims and objectives of the PhD are introduced. The approach to achieving these aims is then laid out with consideration for how this would be done in relation to the inSCALE project and the specific, guiding epistemological assumptions that have informed my approach. The Ugandan research setting and community health worker strategy, the Village Health Team (VHT) programme, are then examined. Finally I reflect on the impact of my background and perspective in a section on 'positionality'.

The PhD is presented over seven Chapters. After providing the background information described above in Chapter 1, Chapter 2 contains a review of the work motivation, social identity and community health worker motivation literature. In Chapter 3 I explain how this literature and formative research results informed the design of the inSCALE interventions. The interventions were tested within the inSCALE project using a cluster randomised control trial (RCT) design. This required the development of valid VHT work motivation and social identification measurement scales. The results of the RCT are not presented within this PhD, but the development of the two scales and descriptive statistics of the quantitative measures are presented in Chapters 4 (work motivation) and 5 (social identification) respectively. In Chapter 6, I qualitatively examine the nature of the relationship between VHT social identification and work motivation, and the proposed influence of the inSCALE interventions. In the final Chapter I reflect on the results generated through the PhD and their programmatic and research implications.

This PhD has developed and evolved over seven years. The many papers published on community health worker motivation in that time have contributed to the development of the ideas presented and the interpretation of my results. Several of these papers have added to the growing calls for increased programmatic and research emphasis on community health workers as community members. It is, they claim, in understanding their needs as

'brokers' between community and health systems that more useful insights may be gained. This PhD adds to these calls. It also suggests that efforts to motivate community health workers require greater reflection on what is actually being motivated if improved performance is truly the aim. This suggestion, and the research evidence on which it is based, were guided by the Social Identity Approach. I believe that using the Social Identity Approach in this manner represents a new and fruitful approach to the development of effective community health worker motivation research and programmes.

1. Introduction

In this chapter the background to volunteer community health worker strategies, key constraints to their effectiveness, and approaches to address these constraints are first described. The aims and objectives of the PhD are then presented, before the Ugandan study setting is introduced and the relationship between the PhD research and the inSCALE project is clarified. Finally the PhD structure is explained.

1.1. The motivation of community health workers

1.1.1 Who are community health workers?

The term 'community health worker' (CHW) describes a diverse range of health providers that are typically resident in the communities within which they work Campbell et al. (2013), (Kok et al., 2015b). While they typically have a healthcare delivery focus, and receive some form of training, they have no formal certified or degree based professional accreditation (Lewin et al., 2007). The nature of the tasks CHWs are vested with, the duration of their training, as well as their age, education, gender and whether they are paid or voluntary varies widely (Lewin et al., 2007, Bhutta et al., 2010, Perry et al., 2014). This section briefly describes the evolution of CHW strategies to the present day where CHW strategies implemented at national scale are commonly relied upon by Ministries of Health in low income settings (Perry et al., 2014).

In the 1960s and 70s there was increasing recognition that exporting western, facility-based healthcare approaches to low income or developing countries was not influencing disease incidence or poor health in communities (Campbell and Scott, 2011). Building on this recognition, and the primary health care movement enshrined in the declaration of Alma Ata in 1978, several countries began CHW programmes (Liu et al., 2011, Perry et al., 2014, Ata, 1978). Several reviews trace the evolution of large scale CHW strategies from this point, through the 1980s and 90s to the present time. They note that in the 1980s several CHW programmes failed due to inadequate training, supervision and poor in-country support as well as reduced funding because of economic crises. In the 1990s many CHW programmes deteriorated and were assumed to be unfeasible at national scale, or a temporary fix rather than an essential element of the health system (Haines et al., 2007, Lewin et al., 2007, Liu et

al., 2011, Perry et al., 2014). This, combined with an increased focus on vertical programmes, led to many national level CHW programmes being disbanded (Bhutta et al., 2010, Campbell and Scott, 2011, Perry et al., 2014).

The last few years have seen an increase in the utilisation of CHW strategies in low income settings (Lehmann and Sanders, 2007, Sundararaman, 2007, Kane et al., 2010, Kok et al., 2015a). This has commonly been attributed to Health Ministries heeding WHO's promotion of 'task shifting' from, typically, nurses and doctors to lay or community health workers in order to address human resources skills shortages (WHO, 1993, Schellenberg et al., 2003, Travis et al., 2004, Chen et al., 2004, Panisset, 2004, WHO, 2008b, Bhutta et al., 2010, Campbell and Scott, 2011), enduring belief in the importance of universal healthcare provision, and the continuing challenge to healthcare provision represented by those with poor access to health facilities (Victora et al., 2013).

Despite this upsurge of activity, recognition of several pervasive challenges when seeking to bring effective CHW programmes to national scale remain. These include the level of community and health system support for CHWs, maintenance of funding and incentives, and supervision and training (Perry and Crigler, 2013, Walker et al., 2013). A key focus has also been the maintenance of levels of CHW work motivation, commonly seen as a constraint to the effectiveness of scaled up CHW programmes (Greenspan et al., 2013, Colvin, 2014). Worker motivation, retention and performance remain of concern to those utilising CHW strategies (Chen et al., 2004, Strachan et al., 2012, Mays et al., 2017). Understanding these challenges for Ugandan CHWs, known as Village Health Team members (VHTs), is the focus of this PhD.

1.1.2 CHW motivation as a constraint to the effectiveness of scaled up public health strategies

The importance of health worker motivation in the provision of good quality health care was recognised by the WHO in their World Health Report (WHO, 2006) and their Agenda for Global Action (WHO, 2008a). Motivation and the factors influencing it have been demonstrated to have 'predictive value' when it comes to influencing health worker effort and performance (Borghi et al., 2017) (p. 2). The important role played by CHW motivation in the effectiveness of scaled up CHW programmes has been increasingly recognised in the literature (Colvin, 2014, Ludwick et al., 2014, Banek et al., 2015, Shipton et al., 2017). Relatedly, calls for research to support the effectiveness of scaled up CHW programmes have

often focused on the need for better understanding of the range of influences on CHW motivation (Haines et al., 2007, Greenspan et al., 2013, Maes and Kalofonos, 2013). Despite this, a lack of evidence for effective strategies to motivate CHWs and improve their retention and performance remains (Bhattacharyya et al., 2001, Mueller et al., 2005, Haines et al., 2007, Chandler et al., 2009, Strachan et al., 2012, Sanou et al., 2016).

Motivation has been defined as 'the psychological processes that determine the direction, intensity and persistence of actions' (Kanfer, 1999) (P.1). Work motivation in relation to paid and volunteer health workers in low income settings, is commonly understood as 'an individual's willingness to exert and maintain an effort towards organisational goals' (Franco et al., 2002) (P. 1,225). Motivation has been recognised as a complex, social phenomenon that is subject to a range of influences occurring both within and outside both the individual and their work environment (Franco et al., 2002, Kok et al., 2015a).

To date, strategies designed to influence CHW motivation have typically focussed on identifying the optimum package of incentives to motivate workers (Franco et al., 2002, Mueller et al., 2005, Mathauer and Imhoff, 2006, Chandler et al., 2009, Glenton et al., 2010, Strachan et al., 2012, Colvin, 2014). Research into the motivational properties and impact of incentives has typically conceptualised motivation as an individual, cognitive process where incentives influence internal (e.g. values) and environmental (e.g. individual perceptions of contextual factors) components (Franco et al., 2002, Franco et al., 2004, Chandler et al., 2009). Such a focus on motivational influences occurring within the individual, where context and social influence are relatively confined to an individual's perception of them, is consistent with the dominance of the individualist behavioural paradigm (Haslam, 2004).

1.1.3 A model of community health worker motivation

Lynne Franco and colleagues developed a widely cited and influential model of work motivation which they applied to health workers in low income settings in the early 2000s (Franco et al., 2002, Franco et al., 2004). Utilising incentives to motivate CHWs is consistent with the individual behavioural paradigm and specifically, the social cognition theories that informed Franco et al's model development (Franco et al., 2002, Franco et al., 2004). The overall aim of the model was to achieve greater compatibility between worker and employer goals and ultimately improved worker motivation. It has also been used to develop measurement scales for measuring motivation. For instance, Chandler (2009) drew on Franco et al's model (2002 and 2004) to explore 'internal' and 'environmental' aspects of

health worker motivation when developing and validating a work motivation measurement scale (Chandler et al., 2009)[1]. While it breaks down the determinants of health worker motivation into three layers - individual level determinants, work context / organisational determinants, and determinants resulting from broader society and culture – it assesses them from the standpoint of individual cognition[2].

While offering key insights into the individual cognitive processes of motivation, models such as Franco's (2002 and 2004) and later Chandler's (2009) have been criticised. Campbell and Scott (2011) for instance argue that models that focus on individual cognition tend to underemphasise the need for CHW programmes to be 'embedded' in the community (Campbell and Scott, 2011). They suggest understanding community context and culture beyond individual cognitions is critically important when seeking insight into the constraints and facilitators of CHW motivation (Campbell and Jovchelovitch, 2000, Glenton et al., 2010, Campbell and Scott, 2011, Strachan et al., 2012). As a result there is unlikely to be a package of incentives that is generalizable across contexts (Bhattacharyya et al., 2001). Instead, exploring the influence of community and work environments on the social norms, priorities and motivations of CHWs should be the priority for researchers and programme developers (Bhattacharyya et al., 2001, Glenton et al., 2010, Strachan et al., 2012, Kok et al., 2016). Exploring the working context and understanding the key role it plays as a complement to more individually focused enquiry is also in keeping with contemporary work motivation research (Kanfer et al., 2012, Kanfer et al., 2017). This research is explored in Chapter 2.

As noted above, despite the identification of need in the literature, there is limited evidence for effective strategies to address the challenge of CHW work motivation. Furthermore, there are few examples of strategies that have sought to address CHW motivation with an explicit focus on CHW's working context, that is, their community. This PhD aims to contribute to addressing these gaps. It will do this by supplementing approaches to improving CHW work motivation informed by Franco et al's (2002 and 2004) and Chandler et al's (2009) conceptualisation of work motivation with a novel approach. The Social Identity Approach provides the theoretical basis for measuring, exploring and understanding the

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[1] Indeed Franco et al's (2002) definition of work motivation and the survey development process folowed by Chandler et al (2009) are adopted in Chapter 4 where the development process and validation of a VHT work motivation survey is presented.
[2] Social cognition models of work motivation are explored in some depth in the literature review presented in Chapter 2.

influence of the CHW working context on work motivation and performance. It is introduced in the next section.

1.2. An opportunity to more effectively motivate community health workers: The Social Identity Approach

The Social Identity Approach (SIA)[3] (Haslam, 2004, Turner and Reynolds, 2010) may provide tools for the development of a more group based and contextually adaptable CHW work motivation strategy. The SIA is a behavioural theory which accounts for both individual cognition and contextual factors. It is psychological in that it offers insight into the processes within an individual that determine behaviour (Haslam et al., 2000, Turner and Reynolds, 2010). Critically, it is also social and therefore contextual as it demonstrates how these processes are dependent upon interpersonal relationships and group memberships, and their perceived value and significance to the individual (Turner and Reynolds, 2010). It is increasingly being applied in the context of work motivation - albeit more typically in high income countries - (Haslam et al., 2000, Haslam, 2004) with this application yielding evidence for the link between identification and motivation among, for instance, Dutch university students (Van Knippenberg, 2001) and German teachers (van Dick and Wagner, 2002) and call centre workers (Wegge et al., 2006).

It is proposed that the SIA provides a theoretical lens through which to understand the socially nuanced influences on CHW motivation that have been acknowledged in the literature. Importantly, it also has the potential to guide intervention design. Both applications of the SIA are pursued in this PhD.

1.3. PhD research focus, aims, objectives and methods

1.3.1. Research focus
Ugandan Community Health Workers, known as Village Health Team members (VHTs), are the research subjects of the PhD. The rationale for focusing on Ugandan VHTs is that their

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[3] The SIA was a term coined to describe social identity theory and social categorisation theory and the bank of empirical work and evidence based practices that have been developed through the thirty or so years of the approach's development (Haslam, 2004).

work motivation has been identified by the Ugandan Ministry of Health as a constraint to the effectiveness of scaled up health strategies that rely on VHTs. The focus of the PhD is to examine Ugandan VHT's work motivation through the analytical lens of the Social Identity Approach.

Section 1.4 contains background related to the Ugandan research setting including the health system, the VHT programme and VHT motivation.

1.3.2. Aim

The primary aim of this PhD is to understand what influences VHT work motivation. A secondary aim of the PhD is to explore whether the Social Identity Approach has the potential to inform effective strategies to improve VHT work motivation.

1.3.3. Objectives

The objectives of the PhD are to:

1. Develop two interventions that aim to improve the work motivation of Ugandan VHTs
2. Develop valid, reliable and practical scales to measure VHT work motivation and social identification
3. Explore and explain the nature of the relationship between VHT social identification and work motivation, the influence (if any) of the interventions on this relationship, and the implications for VHT work performance
4. Reflect upon the implications of the data generated in the PhD for those seeking to improve the performance of Ugandan VHTs and community health workers elsewhere through a focus on their work motivation.

1.3.4. Methods utilised to achieve study objectives

The objectives of the study were addressed by:

1. Conducting a literature review to inform intervention and measurement scale development (objectives 1 and 2)
2. Utilising quantitative measurement scale development methods to validate VHT work motivation and social identification measurement scales and establish whether there is a relationship between the two constructs (objectives 2 and 3)
3. Employing three rounds of qualitative research:
   a. Formative research to inform the design of the interventions (objective 1)

b. Cognitive interviewing to assist development of the measurement scales (objective 2)

c. Associative interviews to explore the nature of the relationship between VHT work motivation and social identification including influence of the interventions (objective 3)

4. Exploring the methodological, programming and policy implications of the data generated through the PhD research in light of findings from relevant literature (objective 4).

1.4. The research setting: Uganda

1.4.1. Geography

Uganda is an East African country landlocked by South Sudan to the north, Kenya to the east, Tanzania to the south, Rwanda to the south west and the Democratic Republic of Congo to the west. The equator runs through the south of the country which sits on average 1,200 metres above sea level. Uganda has an equatorial climate characterised by moderate, humid and hot conditions and two rain seasons (UNDP, 2013). Uganda occupies 236,000 square kilometres which is slightly less than Great Britain and Northern Ireland (245,000) (UNDP, 2013).

1.4.2. Population

Uganda has a population of 41.5 million people (World Bank, 2017) and is in the global top five for fertility rate with a Ugandan woman currently expected to bear 5.8 children through her lifetime (CIA, 2017); a decline from 7.1 in 1990 (World Bank, 2018). 18% of Uganda's population live in urban areas (UBoS, 2016).

1.4.3. Economics

Approximately 80% of Uganda's population rely on agriculture for their livelihoods and the agricultural sector accounts for 90% of the country's export earnings (UNDP, 2013). The proportion of the population living below the poverty line has dropped from 56.4% in 1992 to 19.7% in 2012 (POPSEC, 2014). Uganda remains a poor country as indicated by its global health development index[4] ranking of 161 out of 187 countries (UNDP, 2012).

1.4.4. Life expectancy and under-five mortality

Ugandans have a life expectancy at birth of 52 (global average 68) (WHO, 2010). The neonatal mortality rate is 21 and the under-five mortality rate is 53 per 1,000 live births based on 2016 data with 14% reportedly due to pneumonia, 8% to malaria and 8% to diarrhoea (UNICEF and WHO, 2017).

1.4.5. The Ugandan health system

The Ugandan Ministry of Health governs and regulates public sector health provision in Uganda. The health system operates at tiered levels with the village based VHTs at the first level and the national referral hospital (Mulago) the last (seventh). The coordination and responsibility for health service delivery is largely decentralised to the District. Table 1.1 outlines the different levels of health service delivery in Uganda with an indication of the populations they serve (MoH, 2010).

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[4] The Human Development Index is a composite measure of health, education and income (UNDP, 2012).

Table 1.1: Levels of the Ugandan health system and population served

Level [a]	Type of worker/facility	Population served
Health Centre 1 - Village	Community health worker (volunteer)	Villages in Uganda - 5,842 [b] Average population per village - 717 with mean household size of 4.7 [c,d]
Health Centre 2 - Parish	Facility – paid health staff, most senior is comprehensive nurse	Average villages per parish – 7.8 [b]
Health Centre 3 - Sub-county	Facility – paid health staff, most senior is clinical officer	Average parishes per sub-county – 5.3 [b]
Health Centre 4 - County	Facility – paid health staff, most senior is doctor	Average sub-counties per county – 5.6 [b]
Health Centre 5 – District hospital	Facility – paid health staff, most senior is medical specialist	Average counties per district – 2.2 [b]
Health Centre 6 – Regional referral hospital	Facility – paid health staff, most senior is medical specialist	Four regions - Central (27.5% of national population), Northern (20.75%), Eastern (26.11%) and Western (25.62%)[d]
Health Centre 7 – National referral hospital	Facility – paid health staff, most senior is medical specialist	Ugandan national population – 41.5 million [c]

[a] Ugandan Ministry of Health, Health Sector Strategic and Investment Plan (MoH, 2010)
[b] The 2016 Ugandan General Elections Statistics (Uganda, 2016)
[c] Uganda Country Profile, The World Bank (World Bank, 2017)
[d] The Ugandan 2014 National Population and Housing Census (UBoS, 2016)

1.4.6. Ugandan community health workers - The Village Health Team strategy

Uganda was one of the first African countries to utilise CHWs at national scale through its Home Based Management of Fever strategy, which aimed to improve prompt and appropriate treatment of presumptive malaria for children below five. The Home Based Management of Fever strategy was implemented in stages in Uganda's districts from 2002 (Nsungwa-Sabiiti et al., 2007, Nsabagasani et al., 2007, Bhutta et al., 2010). It drew on a volunteer cadre of CHWs known as community medicine distributors, who were in 2010 incorporated into the new, national Village Health Team strategy (Nsungwa-Sabiiti et al., 2007, Nsabagasani et al., 2007, MoH, 2010, MoH_Uganda, 2010b). Now part of a collective of CHWs known as the village health team, community medicine distributors (colloquially known as 'VHTs') provide health promotion / education, treatment and referral for malaria for children below five years of age but also for diarrhoea and pneumonia, collectively known as integrated community case management (iCCM) (MoH_Uganda, 2010a).

The structure of the VHT strategy is outlined in the VHT Strategic and Operational Guidelines, which specifies that a village health team should be comprised of five members or one for every 25-30 households (MoH_Uganda, 2010b). In practice, due to resource constraints and lack of eligible candidates, this figure is commonly just two[5]. According to the Ugandan Annual Health Sector Performance Report 2017/18, in 2014/15 75% of Ugandan villages had a functional VHT with 179,175 VHT members working in what was then all of Uganda's 112 districts (MoH_Uganda, 2018). Babughirana et al (2016) have suggested this represents 100% VHT coverage in 75% of districts with the other 25% having VHT coverage in the range of 0% (i.e. in Kampala, the densely populated capital city of Uganda) to 99% (Babughirana et al., 2016). No data were identified regarding the gender split of these VHTs. There are currently 127 districts in Uganda (USAID, 2017).

VHT members undergo a five day 'basic' training programme which covers health promotion, identification of danger signs and referral, maintenance of registers, reporting and service delivery (MoH_Uganda, 2010b). In practice, the 5 day training which was originally planned to be 10 days and has not always been effectively adapted for 5 day delivery, has been inconsistently implemented and is commonly supplemented with a range of additional content from implementing partners (typically NGOs) (MoH_Uganda, 2015). This content reportedly ranges from disease focused (e.g. HIV and TB and malaria) to family planning, water and sanitation and nutrition (MoH_Uganda, 2015).

In addition to their 'basic training' two VHT members are selected for additional training over six days in iCCM (MoH_Uganda, 2010a). The focus of the training is roles and responsibilities, appropriate child consultation, diagnosis, treatment and referral for malaria, pneumonia and diarrhoea, medicines management and delivering appropriate home care advice (MoH_Uganda, 2010a). The specific remit of iCCM trained VHTs is to; treat children for malaria, pneumonia and diarrhoea and counsel their carers in appropriate support, refer children to health facilities, follow up children who have been treated (at the health facility or by the VHT), conduct home visits for mothers and newborns, keep records of patients seen and provide them to the nearest health facility, and to be aware of the potential for, and report adverse reactions to, medicines (MoH_Uganda, 2010a). According to the

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[5] According to the VHT strategy, recruited VHT members should be; a third female, honest, trustworthy and respected, willing to serve as a volunteer, a resident of the village, available to perform specified VHT tasks, interested in health and development matters, a good mobiliser, listener and communicator, able to read and write in the local language, dependable and approachable, and aged 18 years or above (Uganda MoH, 2010).

Ugandan Ministry of Health's Annual Health Sector Performance Report 2017/18, in the financial year 2017/18 iCCM of malaria, pneumonia and diarrhoea for children below five years of age was being implemented through the public sector with implementing partner assistance (UNICEF, Malaria Consortium, Save the Children) in 70 Ugandan districts (MoH_Uganda, 2018). This public sector implementation covered whole districts. This approach was complemented by a private sector implementation typically targeting towns and built up areas with the support of partners such as the Clinton Health Action Initiative, World Vision, BRAC and Plan International (MoH_Uganda, 2018).

VHTs are ostensibly recruited by the communities in which they live but the specific details of how this occurs are poorly specified and likely to vary with many appointed by the local council (Turinawe et al., 2015). VHT members are technically supervised by paid health workers from the nearest health facility (health centre 2, 3 or 4) with a specified minimum of one face-to-face supervision encounter per quarter with each supervisor providing supervision for 25 to 90 VHTs (MoH_Uganda, 2010b). VHTs are unpaid but the Ugandan iCCM guidelines suggest that support in the form of supply of medicines and increased VHT knowledge about managing childhood illnesses from training will be motivating (MoH_Uganda, 2010a). Travel costs for supervision meetings at the health facility and collection of materials are refunded to the tune of approximately US$4 per month (MoH_Uganda, 2010b). Supportive supervision of VHTs is commonly reported to be sub-standard which has been attributed to both a lack of funding for transport and lack of technical capacity (MoH_Uganda, 2016a).

While policy oversight for the VHT programme is retained at national level, the management and supply for all commodities, coordination of implementation and support and training of supervisors is devolved to and operationally coordinated at district level (Kyaddondo and Whyte, 2003, MoH_Uganda, 2010a, MoH_Uganda, 2010b). Funding for VHT programmes has largely come from external donors despite the strategy being nationally accredited (Namazzi et al., 2017). District level operation and coordination reportedly often ceases when this donor support expires (MoH_Uganda, 2016a). While the role of non-governmental organisations (NGOs) is increasingly transitioning from implementation to technical support and quality assurance, this has left a funding shortfall government is not always reportedly capable of addressing (MoH_Uganda, 2016b, Namazzi et al., 2017, Mays et al., 2017). It was not possible to access information regarding the operations of discretely funded VHT programmes in order to assess variances in implementation.

Where VHTs are in place and operational, experiences from implementation of the Home Based Management of Fever strategy indicate that their supervision and motivation are critical constraints to the effectiveness of community-based delivery of health care (MoH_Uganda, 2010a). In common with similar programmes in other low-income settings, the poor performance and retention of VHTs has been attributed, in part, to their motivation (Chen et al., 2004, MoH_Uganda, 2010a, Strachan et al., 2012).

A review of the current literature relating to CHW motivation, with a focus on Ugandan VHTs, appears in Chapter 2.

1.5. Description of the hosting research study: The inSCALE project

The research conducted for this PhD took place within and in support of the Innovations at Scale for Community Access and Lasting Effects (inSCALE) project. This Bill & Melinda Gates Foundation funded project was a collaboration between Malaria Consortium, the London School of Hygiene and Tropical Medicine (LSHTM) and University College London's Institute for Global Health (UCL IGH). The primary aim of the inSCALE project was to improve the quality of care received by children under five from CHWs delivering iCCM of childhood diseases (malaria, pneumonia and diarrhoea) in Uganda and Mozambique. In order to achieve this, a secondary aim of the project was to develop and evaluate cost-effective and scalable interventions, using a randomised control trial design, that increase the motivation, retention and performance of CHWs (Källander et al., 2015a). The work presented in this PhD contributed to the achievement of this secondary aim in Uganda. Malaria Consortium led and coordinated the project and, with an in-country team in Uganda and Mozambique, implemented the interventions. LSHTM held leadership responsibility for the evaluation of the project. UCL IGH were responsible for the formative research leading to intervention design as well as the theoretical basis for the interventions. UCL IGH also led the project process evaluation relating to VHT work motivation and supported the outcome evaluation.

The inSCALE project developed two integrated intervention packages that utilised different approaches to increase the motivation, retention and performance of VHTs. The first was a participatory, community engagement approach and the second was a mHealth-supported approach. The process of development of these two intervention packages, the proposed pathway to effectiveness and specifically how they were based on formative research and social psychological theory, is described in Chapter 3. In Appendix 9.1 (Table 9.1) the key

components of each intervention are described. More detailed descriptions of the implementation of the community engagement approach (Frank et al., 2015) and mHealth supported approach (Frank et al., 2016) can be found in dedicated publications that I contributed to. They appear in Appendix 9.2 (community engagement approach - the village health clubs) and 9.3 (mHealth supported approach) respectively. In this section, a summary of the inSCALE project trial's scope and implementation is provided.

In Uganda, the inSCALE project took place in eight districts in the Western Region of the country (Buliisa, Hoima, Kibaale, Kiboga, Kiryandongo, Kyankwanzi, Kyegegwa, and Masindi). These districts, at the time of inSCALE project implementation, were estimated to have 1.8 million people in approximately 4,000 villages, 20% being children below the age of five, and approximately 10,000 VHTs, 5,700 of whom were trained in iCCM between July 2010 and June 2011 (Källander et al., 2015a). Figure 1.1 displays a map of the Districts of Uganda with the inSCALE and PhD research districts shaded green. Most of the population across the districts live in rural areas with the two biggest towns of Hoima and Masindi having populations of 100,625 and 94,622 respectively according to 2014 census data (UBoS, 2016).

In the eight inSCALE districts Malaria Consortium, with a grant from the Canadian International Development Agency (CIDA), has supported the district wide implementation of iCCM delivered through VHTs since July 2010 (Källander et al., 2015a). Malaria Consortium, funded by CIDA, supported the government's iCCM strategy through the provision of technical support, training of VHT trainers and VHTs, aids the government supply of health facilities and VHTs with medicines and supports monitoring and evaluation of the iCCM programme at health facilities and district level (Källander et al., 2015a). This was important to the viability of the project given the reportedly inconsistent levels of support provided by the Ugandan government and implementing partners for the VHT programme across Uganda (Mays et al., 2017). The inSCALE interventions focused on iCCM trained VHTs.
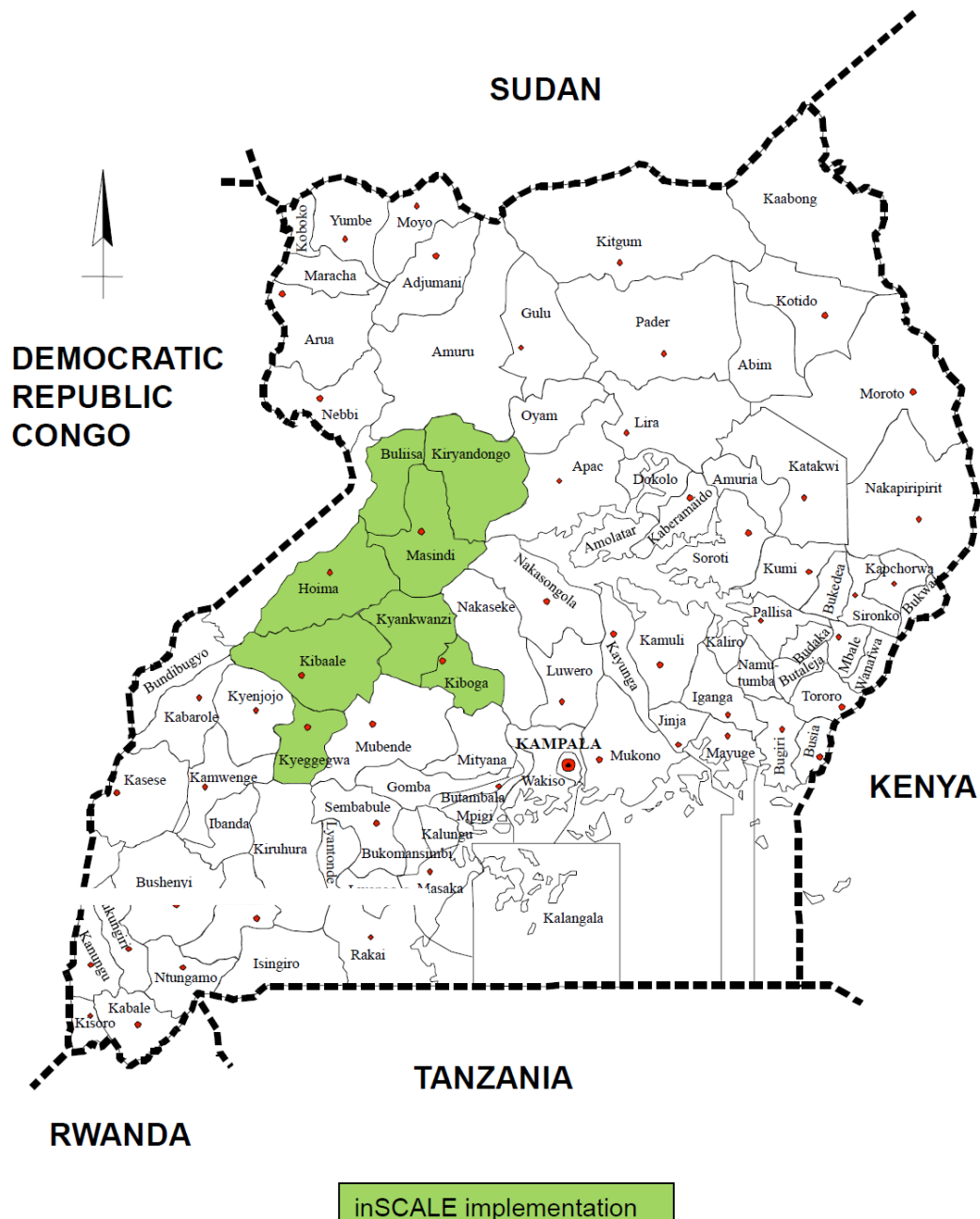
Figure 1.1: Districts of inSCALE project and PhD research implementation
(Källander et al., 2015a)

The two inSCALE interventions were randomised for implementation in 26 sub-districts (13 for each intervention 'arm') across the eight inSCALE districts with a further 13 sub-districts randomised as control areas. Children in control areas continued to benefit from the routine government rollout of iCCM supported by Malaria Consortium's CIDA project as described above (Källander et al., 2015a). Approximately 3,000 VHTs were randomised to the three

arms of the trial in total (884 VHTs in the community arm, 1,277 in the technology arm and 879 in the control arm) (Källander et al., 2015a, Frank et al., 2015, Frank et al., 2016). For the technology arm, more than 50 trainings were held for 1,277 VHTs that included 37 health facility based supervisors. VHTs received training in the components of the intervention implementation as well as instructional SMS messages and printed 'troubleshooting guides' (Frank et al., 2016). For the community arm, 884 VHTs were trained in a cascade where first eight master trainers (five district, one Ministry of Health and two Malaria Consortium staff) were trained, including conducting a pilot training of 17 VHTs, followed by two, three day *training of trainers* sessions. This resulted in 39 trained sub-county level health workers who trained two VHTs in each of 440 project villages (Frank et al., 2015). See Appendices 9.2 and 9.3 for further details regarding intervention implementation and development. The inSCALE project officially ran between 2010 and 2016 with intervention implementation occurring between late 2012 and the final evaluation and collection of main outcome data between March and May 2014 (Källander et al., 2015a). At the time of PhD submission, partners were still collaborating on the final evaluation paper.

The inSCALE project's trial protocol (Källander et al., 2015a) was approved by Makerere University Institutional Review Board in Uganda and the London School of Hygiene & Tropical Medicine Research Ethics Committee in the UK (ref. 5762). Within the protocol, further details regarding the trial rationale, design, randomisation process and relationship with the 'CIDA project' are provided. The inSCALE project was registered as a randomised controlled trial with http://www.clinicaltrials.gov (identifier NCT01972321).

1.5.1. PhD research and employment at UCL, Institute for Global Health in relation to the inSCALE project

I was employed by UCL, Institute for Global Health to work as a Senior Research Associate on the inSCALE project in April 2010. I officially commenced my PhD in October 2011 and, working part-time, submitted in October 2018. I was based in Uganda from 2007 before moving to London in October 2013. I continue to be employed by UCL, Institute for Global Health as a Senior Research Associate and Teaching Fellow.

With the approval of the inSCALE project study group[6], I was able to include my contributions to the achievement of the aims of the inSCALE project in Uganda in my PhD. I designed all research methods and analysed all data relating to VHT social identity, identification and work motivation reported in the PhD unless specified. This includes Chapter 3 where I present the inSCALE intervention development process and how it was informed by formative research and theory. It also includes Chapters 4 and 5 where I present the development and validation process for work motivation and social identification measurement scales and Chapter 6 where I present the results of qualitative enquiry into the nature of the relationship between VHT work motivation and social identification. I supervised or conducted all data collection for the PhD research. All data collection was funded by the inSCALE project. The results generated through the PhD research have been incorporated into the inSCALE project's formative, process and outcome evaluations. My role on the inSCALE project was research based with a focus on formative research that informed intervention design and the process and outcome evaluation of the interventions. I was not involved in the implementation of the inSCALE interventions beyond my role in their design. I was already living in Uganda at project commencement and moved to London in October 2013.

In Table 1.2 a timeline of inSCALE project and PhD research activities is presented. All PhD research activities were included in the successful, ethical approval applications described above.

Table 1.2: Timeline of key inSCALE project and PhD research activities

Year	inSCALE project activities	PhD research activities	Chapter
2009	Project commencement	N/A	
2010	Uganda national and international stakeholder consultation		
	Reviews of various, relevant literature relating to supervision, motivation, data management, mHealth and others	Literature review – work motivation and social identification	2
2011	Formative research (FR) towards intervention design Baseline study	Qualitative research to inform the design of interventions likely to motivate VHTs	3
2012	Intervention design and implementation (late 2012)		

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[6] The inSCALE project study group comprised senior personnel from each of the three partner organisations, namely; Malaria Consortium, the London School of Hygiene and Tropical Medicine and University College London.

2013	Endline survey development – household, VHT and health facility	Cognitive interviews with VHTs to improve and qualitatively validate measurement scales in relation to motivation and social identity	4&5
	Process evaluation	'Associative interviews' with VHTs to explore VHT work and the nature of the relationship between work motivation and social identification	6
2014	Endline survey (March-May)	Quantitative validation of the endline work motivation and social identification measurement scales	4&5
2015	Official project completion Uganda	Data analysis and write up of the social identity and motivation components of the project	All
2016	Official inSCALE project completion		
2018	Final outcome papers drafted		

1.6. Epistemological position

Different approaches have been taken when applying psychological frameworks to real life settings. Those that see individual behavioural outputs as primarily a function of individual processes, typically those from the North American social psychological tradition, tend to focus on individual constructs, such as personality and attitudes (Farr, 1996, Hepburn, 2003). Those that see individual behavioural outputs as more a function of social or cultural, or at least interpersonal influence, while maintaining an interest in individual differences and the methods designed to assess them, are more rooted in a European social psychological tradition (Hepburn, 2003).

This PhD follows in the European tradition of critical social psychology. This means that the opportunities and constraints of the social context within which VHTs operate, and issues such as social mobility, power, empowerment and critical consciousness are considered when designing research methods and interpreting results (Crossley, 2000, Campbell, 2003, Hepburn, 2003).

1.7. Positionality

As a non-native Ugandan, hosted during data collection by the NGO commonly viewed by VHTs as financing the VHT programme (i.e. Malaria Consortium), I was aware of the potential for social desirability bias influencing the results generated. I also acknowledge that my own perspectives and biases influenced the collection and interpretation of research data. I was

resident in Uganda from 2007 to 2013, so both prior to and during the data collection period. This allowed for the development of relationships and particular insight and influence that enabled privileged access to knowledge and respondent testimony. The risk was that these advantages would lead me to collect data unaware of the impact and bias of my role in their generation.

These perspectives and biases - both conscious and unconscious - required strategies be implemented lest they inappropriately influence the research process and interpretations of the findings. Objective 'truth' was not the aim, instead a reasonable interpretation of the perspectives of research participants, principally VHTs, that have offered their opinions and reflections (Sultana, 2007). From the literature related to participant observation research, I took two useful insights in this regard. The first was that unless the perspectives of participants were appropriately captured and interpreted, my status as an outsider was likely to lead to the collection and interpretation of data from a privileged perspective (DeWalt et al., 2010). The second was that while an outsider in several obvious respects, I was also an insider based on my institutional relationship to Malaria Consortium and status as a health focused researcher. In this way my role was akin to the observer-participant so named by Sufrin (2015), whose insights in the clinical encounter as a physician were complemented by training as an anthropologist (Sufrin, 2015). My aim was to parlay the advantages of my training, contacts and experience into appropriate methods of data collection, while limiting the potential for bias.

The specific approaches adopted are discussed in relation to the methodologies used in each chapter of the PhD. In addition the following steps were taken during qualitative data collection with the aim of reducing bias:

1. Multi-lingual fieldworkers were recruited so that respondents could speak in the language they were most comfortable
2. Key words were workshopped during training with fieldworkers to ensure consistency of terminology and interpretation of meaning across interviewers and over time
3. Extensive field notes, where reflections on the research process, key data collection decisions and preliminary findings were recorded. These were used to aid interpretation of the findings and establish qualitative themes during data analysis
4. Daily debriefing sessions were held with fieldworkers to review the methodology, address any challenges and discuss interpretation of initial findings

Immediately following each data collection period further debrief sessions with fieldworkers were held. In these discussions, I crosschecked and validated my thoughts, reflections and preliminary interpretations of the data with the fieldworkers.

In addition, for the associative interviews in Chapter 6:

1. Respondents were encouraged to talk about what was most meaningful to them within the broad research focus (i.e. associations with 'being a VHT') rather than discussing researcher determined content

2. Fieldworkers were trained to draw on the interviewees own terminology when encouraging elaboration as often as possible.

While these steps were taken, and I was aware of the potential influence of my role throughout the research process, the risk of biasing the results remained. I reflect further on my role in the research process and the impact on the data collected in the last Chapter.

1.8. Structure of the PhD

In Chapter 1, the introduction, the background to the research including the gap it addresses, and the project rationale, aims and objectives are presented. Chapter 2 presents a review of work motivation theories, the Social Identity Approach and community health worker strategies. While Chapter 2 contains the main literature review, key insights from the literature relevant to Chapter aims appear in each subsequent Chapter.

The PhD findings are then presented over four chapters which each include a detailed explanation of the research and methods employed. The design of two interventions aiming to improve VHT motivation are presented in Chapter 3. The development and validation of a VHT work motivation measurement scale are presented in Chapter 4. The development process and validation of a VHT social identification measurement scale are presented in Chapter 5. The analysis of community health worker perspectives of their work, drawing on a social identity model of work motivation and performance, are presented in Chapter 6. Chapter 7 contains a discussion of the key findings from across the four results chapters including implications for future strategies seeking to influence the work motivation of community health workers.

Table 1.3 presents a summary of the content of the PhD chapters and an indication of which research objective each addresses.

Table 1.3: List of Chapters with summary of content and objective addressed

Chapter		Content summary	Objective addressed
1	Introduction	Rationale, aims and objectives for the research project, a brief overview of the methods used and explanation of the structure of the PhD	N/A[7]
2	Literature review	Review of work motivation and social identity theories as well as community health worker work motivation strategies	N/A
3	Intervention development	The results of a development process that yielded two interventions designed to improve VHT work motivation based on theory and formative research	1
4	Motivation measurement scale validation	The results of a development process designed to yield a valid and reliable VHT work motivation measurement scale	2
5	Social identification measurement scale validation	The results of a development process designed to yield a valid and reliable VHT social identification measurement scale. Includes measures of correlation between VHT work motivation and social identification	2&3
6	Associative interviews with VHTs	The results from associative interviews with VHTs regarding their identity, motivation and experience of being a VHT. Results analysed based on a theoretical model of social identity, work motivation and performance. Differences between intervention and control areas are explored	3
7	Discussion and conclusion	Reflection on the results presented in Chapters 3-6 in light of the aims and objectives of the PhD	4

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[7] Chapters 1 (introduction) and 2 (literature review) don't introduce new data and therefore do not address objectives.

2. Literature review

2.1 Introduction

This Chapter presents a review of theoretical and empirical literature relevant to community health worker work motivation. It also focuses on the collection of theories known as the Social Identity Approach. The theoretical and empirical work presented in this chapter is drawn on through the PhD; in Chapter 3 to help design interventions, in Chapters 4 and 5 to inform the design of measurement scales, and in Chapter 6 to inform the design and analysis of qualitative work with VHTs.

Understanding the motivation of workers has been a major preoccupation of employers as well as academics at least since the industrial revolution (Haslam, 2004, Latham and Budworth, 2006, Kanfer et al., 2017). This has resulted in a wide range of theoretical positions represented in the literature. A summary of these theories and models of work motivation follows the methods section with the bulk of the reviewed literature from high rather than low and middle income countries (LMICs)[8]. This is followed by a review of theoretical and empirical data from the implementation of strategies aiming to improve community health worker work motivation in LMICs. Finally, a review of the Social Identity Approach is presented. This includes explanation of the theoretical link between social identification and work motivation, and the growing research evidence supporting this link. Again, this draws, in the main, from non-LMICs based studies due to the relative lack of evidence from LMICs.

2.2 Methods

A review was conducted of theoretical literature relating to work motivation, retention and performance in general and to CHW motivation, retention and performance in particular. Electronic internet searches on PubMed, Google Scholar and Web of Science were performed using combinations of the following search terms: 'motivation', 'retention', 'performance', 'work', 'health worker', 'community health worker, 'CHW', 'community based agent' and 'CBA'. Relevant websites, such as www.chwcentral.org, were hand searched, as

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[8] This is attributable to funding from private sector enterprise into productivity focused research and emphasis on the construct of motivation in the workplace within psychology departments of Universities in high income countries, typically in Western Europe and North America (Farr, 1996, Haslam, 2004).

were the reference lists of included resources. Inclusion criteria were relevance to the research question and that studies be reported in the English language. Key CHW motivation resources were also identified through personal correspondence with authors who have published in the area.

The review was used to identify key theoretical dimensions to consider during intervention design and to select a focus theory. The selection of the focus theory to draw on was based on an assessment made by the PhD student and endorsement by the inSCALE study group[9]. This selection and endorsement was made based on appraisal of which theory was most likely to assist the development of effective interventions that would increase CHW motivation, retention and performance in the study context[10]. Once the most suitable theory was selected, a second search, using the same databases, was conducted using the terms 'social identity' and 'social identification'. The initial and second literature searches were conducted in 2010 (see Table 1.2).

2.3 The motivation to work

There are many volumes and reviews which explore the evidence regarding workplace motivation (Eccles and Wigfield, 2002, Latham and Pinder, 2005, Latham, 2007, Kanfer et al., 2017). Commonly they capture the evidence that falls within their epistemological gaze or remit. In this section, theories are explored within five key areas: economic choice theories, social cognition theories, theories of 'personality' or individual difference, and theories based on the needs of workers. The role played by the working context is also examined.

2.3.1 Economic choice theories
In the early part of the twentieth century, enquiry into motivation rested on the assumption that behaviour was subject to an individual and rational appraisal of the pros and cons of a

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[9] The inSCALE study group collectively discussed and made decisions regarding the direction of the inSCALE project including the emphasis of the interventions. Membership of the group included the Principle Investigators from the three project partner institutions (Malaria Consortium, London School of Hygiene and Tropical Medicine and UCL, institute for Global Health) as well as senior staff. Zelee Hill and I were the UCL, Institute for Global Health representatives.

[10] While one of the aims of the inSCALE project was to develop interventions that improved the motivation, retention and performance of CHWs, the PhD focus is on CHW work motivation. This is one of the reasons for including the search terms 'retention' and 'performance' while the focus of what is reported is 'motivation'. The other is that it is important to consider what workers are motivated to do in order to understand their motivation.

certain action or actions (Haslam, 2004). The work of Frederick Taylor at the start of the twentieth century which spawned the Taylor Society and the theory of 'Taylorism' is typical of these 'economic choice theories' (Haslam, 2004 p. 3). Frederick Taylor refined his theory of 'scientific management' (later to become known as 'Taylorism') in a steel manufacturing plant in the late nineteenth century where he single-mindedly sought to maximise profitability (Haslam, 2004, Taylor Frederick, 1911). Taylor believed there was a single 'best way' to perform any work role and the task of management was to select only those optimally suited for a role, treat them based on their individual competencies, as opposed to in a standardised way, and pay based on output. The approach did produce significant upsurges in profitability, hence its enduring popularity. It was however almost invariably accompanied by high levels of unemployment, workers union outrage and social problems leading to less tangible social and economic cost to the community of the often newly profitable business. This has led to a broadening of considerations that typically take greater account of the perspectives of the workers when developing sustainable work motivation strategies (Haslam, 2004). In addition there is evidence, contrary to the principles of Taylorism, that some people will work hard with almost no financial reward (Landy, 1989).

Central concepts of economic choice models and indeed Taylorism endure. For instance individual performance based incentives and bonuses are commonly employed in high income settings, especially in private sector enterprises (Haslam, 2004). Unlike the early, economic choice theories of which Taylorism was typical, these applications have, in more contemporary settings, tended to take account of the thoughts that accompany, predict and determine behaviours. The most important group of theories that accounts for this shift in thinking are social cognition theories.

2.3.2 Social cognition theories

Social cognition theory has been the dominant social psychological theory, certainly in the United States, since the 1970s when introduced by Albert Bandura (Latham and Pinder, 2005, Latham, 2011). Its influence has extended to the study of work motivation (Kanfer et al., 2012). The previously dominant theory of 'behaviourism' eschewed psychological enquiry beyond examining how specific stimuli resulted in certain behavioural responses. It focused exclusively on tangible behaviours to the exclusion of thoughts and feelings. Social cognition theory sought instead to explain 'social behaviour with reference to individual mental processes' (Hepburn, 2003) (p.19).

Social cognition theories have been criticised as being typical of 'social exchange' theories which cast workers as 'motivated tacticians' who base behavioural decisions on an appraisal of cost *vs*. benefit echoing economic choice models (Fiske and Taylor, 1991, Haslam, 2004). Haslam (2004) for instance, argues that the theory can be used to explain any behaviour as a function of a cost benefit appraisal of the expected behavioural outcome by the perpetrator. While conceding that social cognitive perspectives acknowledge the subjective nature of costs and benefits (i.e. perspective), Haslam suggests this weakness in the theory limits its capacity to predict outcomes (Haslam, 2004). Others suggest that the social cognition approach tends to 'assume the significance of universal patterns of information processing' (Hepburn, 2003) (p.31).

Despite these criticisms social cognition theory has introduced empirically supported and influential concepts such as *outcome expectancies*, *self-efficacy*, *goal setting*, *intrinsic* and *extrinsic motivation* and *equity* (Bandura, 1977a, Ryan and Deci, 2000, Winstanley, 2006, Latham, 2011). All have been used previously when seeking an understanding of health worker motivation (Kanfer, 1999, Franco et al., 2002, Chandler et al., 2009). The applied relevance of these concepts to enquiry into CHW work motivation is why proportionately more information has been provided in this section for these theoretical concepts.

Outcome expectancies, self-efficacy and goals

Outcome expectancies refer to the anticipation that behaving in a specific way will result in a specific, related response. Self-efficacy refers to an individual's belief that they can perform the specific behaviour that will elicit this response (Latham, 2011, Winstanley, 2006). Latham (2011) goes so far as to argue that belief in one's ability to perform a task (i.e. self-efficacy) is more important than ability when it comes to performance (Latham, 2011). Bandura argued that people regulate their behaviour according to outcome expectancies. He suggested that over time their behaviour evolves through self-regulation born of the experiences of pursuing positive outcomes and avoiding negative ones (Bandura, 1991). He argued that the degree to which someone will pursue a given, positive outcome depends upon their belief as to whether they can produce the performance they think will result in that outcome (self-efficacy) and that it is worthwhile and of benefit to them (outcome expectancy) (Bandura, 1991, Bandura, 2001b). From this perspective it follows that providing a strong incentive to reach a work target will only result in a worker mobilising extra effort

to achieve the goal if they believe it is attainable through their endeavours (i.e. within their control) and is worth pursuing in the first place.

Goal setting theory

Goal setting theory rests on the premise that based on a person's needs, their values and their contextual influences; they set goals and develop strategies for achieving them. Furthermore, through the process of goal achievement, they develop assumptions about themselves, their context and their identity that inform subsequent goals (Latham, 2011). In a work setting, if employee and employer goals are aligned or 'congruent', then motivation to work is expected to follow (Locke and Latham, 2002).

Intrinsic and extrinsic motivation

Intrinsic motivation refers to the drive to do something because it is inherently interesting or enjoyable, while extrinsic motivation refers to drive to do something in the belief that it will lead to a tangible outcome that is separate from the person (Ryan and Deci, 2000). Despite being an influential theory, and the terms intrinsic and extrinsic motivation having entered the contemporary nomenclature, its actual relevance to work motivation is disputed. The initial theory proposed that when internally motivated to perform a task, persistence in achieving it would be maintained for longer than when an external, extrinsic motivator was introduced (Deci, 1975). This effect was attributed to a drive for 'self-determination' that was undermined by external influences (Deci, 1975). Bandura later suggested the distinction between intrinsic and extrinsic motivators was a false dichotomy and that all situations contain both internal and external inducements (Bandura, 1977b). Locke and Latham further suggested that it was unlikely the drive for self-determination could have a critical bearing on work motivation when it could disappear in the face of commonly occurring external factors such as work based pay and performance targets (Locke and Latham, 1990). Despite these criticisms, intrinsic and extrinsic motivation has been commonly used as the basis for the development of motivational incentives for CHWs (e.g. Colvin et al, 2014).

If situations do contain both intrinsically and extrinsically motivating influences then understanding the perspectives of workers and what these perspectives are influenced by in context would appear to be a logical line of research to pursue. It may, for instance, be the way an incentive is introduced that influences whether it is intrinsically or extrinsically motivating (Latham, 2007). To date a lack of understanding regarding the culturally and

contextually specific factors that influence the value placed on any introduced motivational incentive has limited the theoretical clout of the intrinsic *vs* extrinsic motivational distinction. As a result, motivation theories that have intrinsic and extrinsic motivation as their theoretical basis have been criticised for their assumptions; such as, assuming that motivational drivers like the desire for individual expression and actualisation, are transferable across contexts (Kanfer et al., 2012).

Equity

Equity theory suggests that over time employees develop beliefs about their input and the corresponding output they receive through comparison with others (i.e. colleagues or workers in same or similar sectors) (Latham, 2011). In addition, employee acceptance of organisational aims and outcomes are enhanced by their perception of fairness and equality in the workplace; sometimes referred to as *organisational justice* (Latham and Pinder, 2005). Historically, theories of equity have focussed on tangible rewards and matching incentives. More recently, equity has been considered from the organisational standpoint leading to more transparent and participatory approaches such as collaboration between managers and workers when setting goals (Robbins and Judge, 2007).

2.3.3 Theories of 'personality' or individual difference

The pursuit of personality as an influence on work motivation has been powered by the lure of identifying individually testable traits that can predict, explain and influence employee motivation and work performance (Haslam, 2004). The influence of personality on work motivation only became a focus for theorists towards the end of the twentieth century (Latham, 2011). Before then, other conceptualisations of work motivation were considered adequate. For instance, social cognition theorists argued that a focus on personality was unnecessary when it came to work motivation given the explanatory scope contained within central social cognition concepts such as self-efficacy and outcome expectancy (Bandura, 2001a). Others instead see personality as a mediator, along with context, of the strength and durability of motivational influences such as self-efficacy and outcome expectancy beliefs though the evidence for this has only recently been developed (Latham, 2007, Kanfer et al., 2012).

Recent focus on personality and its influence on work motivation has been on traits that remain stable across work scenarios and are generally predictive of work performance (Latham, 2007). The trait of *conscientiousness* is typical of such focus. Other traits, such as

extraversion may be helpful in some work settings but not others which results in lessened predictive power when it comes to performance. For instance, if extraversion is not helpful to the performance of bus drivers then this trait is unable to predict excellence in this profession (Kanfer et al., 2012).

In settings with well-resourced human resources management functions, personality testing remains common place. The pursuit of personality as a domain of research that can predict, explain and influence employee work motivation continues to be pursued (Haslam, 2004). Often the aim is to try to match durable traits of individual workers to work cultures, with the intention of improving employee retention. In a setting such as Uganda, where there are no known and validated personality measures, it seems unlikely that developing a nationally valid personality measure would be cost-effective. This is assuming there would be the will and capacity to implement a validated personality measure during VHT recruitment. As noted in Chapter 1, VHT recruitment is determined by the community of the VHT. Administering a screening survey for recruitment would not be feasible to implement at community level and at scale.

An additional consideration is that personality models of motivation are predicated on the assumption that the psychological foundation of motivation lies within the individual and is not influenced by social and contextual factors (Haslam, 2004). Presenting a detailed critique of this assumption is not the aim here. Instead it is noted that there is little apparent capacity to influence policy to recruit CHWs on the basis of personality measures despite such strategies being relatively commonplace in corporate recruitment in high-income settings (e.g. use of the Myers-Briggs Type Indicator personality assessment) (Myers et al., 1998). Neither would such an approach address the calls for increased focus on the working context of CHWs when exploring their motivation noted in Chapter 1.

2.3.4 Theories based on the needs of workers

According to needs theorists, work motivation occurs as a function of the interaction between the worker and the work environment, with worker *needs* the critical aspect of this interaction (Kanfer and Heggestad, 1999). The degree to which a worker's needs are satisfied is linked in the literature to their work motivation and the likelihood of remaining in role (Bhattacharyya et al., 2001, Latham and Pinder, 2005, Mueller et al., 2005, Rahman et al., 2010, Latham, 2011). For others, worker needs are more complex and need satisfaction can lead to a range of behavioural outcomes. For example, the power of a given incentive to

exact an increased level of motivation to perform has been seen both as a function of the degree to which the incentive satisfies a worker's needs and how important the satisfaction of those needs is to the worker (Latham, 2007), which may vary over time. If the importance of needs satisfaction varies based on, for instance the time of day, the reliability of an incentive may also vary (Haslam, 2004).

A brief explanation of the positions of the dominant needs theorists are explored in Table 2.1.

Table 2.1: Summary of the main needs based work motivation theories

Maslow and Aldefer
The identification of worker satisfaction as a key influence on whether a worker stays in their role emerged in response to Maslow's theory of hierarchical needs (Mueller, Kurowski, & Mills 2005). Maslow suggests that in order for an individual to address higher order needs, their lower order needs must first be addressed – i.e. one's physiological and safety needs before those based on love, esteem or self-actualisation (Haslam, 2004). Aldefer built on Maslow's theory by suggesting that individuals prioritise needs based on their circumstances, and their varying levels of need in terms of 'existence', 'relatedness' and 'growth' which, unlike Maslow, acknowledged that needs prioritisation was a dynamic and context based process (Mueller, Kurowski, & Mills 2005).
McGregor
McGregor's theory X and theory Y were developed as a needs theory specifically for organisations (Ellemers et al., 2003). For McGregor it is incumbent upon organisations to establish and maintain a work environment that will encourage workers to believe their needs are being provided for which will result in a greater output. He termed this Theory Y which had two sub-sets or 'types'. The absence of such a structure he termed Theory X (Latham 2007). Where motivation based on theory X was seen as dependent on threats, bullying and coercion, theory Y based motivation was seen as either relating to the need for self-esteem generated through confidence, independence, achievement, competence and knowledge (type I) or, relating to reputation based needs contingent upon status, recognition and peer and public appreciation (type II) (Haslam, 2004; Latham, 2007).
Herzberg
Herzberg's two factor theory makes the distinction between workplace influences leading to worker satisfaction and those linked to work motivation. He suggested that while certain elements must be provided within a working environment in order to retain staff, these factors are not necessarily linked to increased performance (Herzberg et al. 1959). According to Herzberg's theory, satisfied workers will not necessarily work harder but they are more likely to remain in role (Sadri and Robertson 1993). Herzberg termed workplace factors that lead to satisfaction as 'hygienes' and cast them as distinct from factors leading to motivation which he termed 'motivators' (Haslam, 2004).

Needs theories commonly operate on a hierarchical scale where lower order needs must be met before higher order needs can be pursued. In a work context, the influence of worker needs satisfaction theories have typically manifested in employers seeking to provide appropriate conditions and tools for role performance. Employer interventions aimed at

motivating workers are typically viewed as likely to have an impact when these lower order needs have been satisfied (Herzberg et al., 1959, Haslam, 2004).

There are important criticisms of conceptualising work motivation as a function of need satisfaction. Chief among these is that while there is general consensus among needs theorists that needs are hierarchically organised, with lower level needs typically more physical and higher level needs more abstract, there is little consensus around the number of levels in the hierarchy. Needs theorists variously suggest five (Maslow), three (Aldefer) and two (Herzberg and McGregor). Also, when each level of need is apparent is often poorly defined by the leading theorists. This, as noted above, can lead to a lack of predictive power regarding the conditions that will lead to motivation in a given context (Landy, 1989).

Examining work motivation from a needs perspective can nevertheless provide useful insight. For instance, when exploring the consequences of an organisational focus on satisfying higher order needs such as recognition and growth while being unwilling or unable to improve working conditions and security. In such circumstances, from a needs theory perspective, while workers may be motivated they may also be prone to leaving for other opportunities given they may not be satisfied. There is empirical evidence to support this. Kyaddondo and Whyte (2003) found that in Uganda, which has a decentralised health system, there is a lack of faith among health workers that the health system will adequately provide for their basic needs (Kyaddondo and Whyte, 2003). This has led to the common adoption of 'survival strategies' or money generating enterprises in the face of this lack of role security. The greatest need for these workers is to provide for themselves and their families which, to some degree, negates the possibility of them performing their role (unless of course this is compatible with generating external income). The pursuit of 'survival strategies', as a response to uncertainty regarding whether a work role is 'secure' or can satisfy expectations, decreases retention levels and highlights the necessity of interventions designed to 'satisfy' workers' basic needs. This, as argued by Herzberg, is necessary in order to keep them in role before seeking to motivate them (Herzberg et al., 1959).

2.3.5 Context as a factor influencing work motivation

The role played by context in the motivation of workers is contentious. Where, from some perspectives, context provides a backdrop for the individual cognitions which lead to motivation (e.g. Franco et al., 2002), from others, the individual's behavioural output is entirely a function of, and subject to, context (Gergen, 1985). From this evolutionary

perspective, humans are adaptive and responsive to their physical and social environments and any behaviour should be understood in acknowledgement of this central influence (Raskin, 2002). From this position the working context warrants greater scrutiny and understanding in any motivation based enquiry than is generally the case (Latham, 2011). The lack of work on contextual influences on motivation has been variously attributed to it being too difficult (Campbell and Scott, 2011), not the conventional way to approach the subject (Hepburn, 2003) or due to the dominance of the individualist behavioural paradigm (Haslam, 2004). There are however some important insights offered by approaches to motivation that have considered different contexts. Examples explored in this section come from cross cultural approaches and those that have considered the dynamism of the work context.

Cross cultural approaches

Cross cultural psychology within the area of work motivation is a key site on which ideological differences about the fundamental drivers of human behaviour are played out. Both individually focused theories and those that explore socially constructed rationalities have been influential. Geert Hofstede's cross cultural dimensions (2011) and Jovchelovitch and Gervais' (1999) multiple belief systems or 'cognitive polyphasia' are typical of these differing perspectives. In his 'cultural dimensions' Hofstede suggests that in order to understand an individual's work motivation it is important to first understand how their culture influences their scores on four dimensions. From the perspective of 'cognitive polyphasia', the focus of work motivation research should be on understanding the often multiple value systems and principles of practice that people hold. Summaries of both theoretical perspectives appear in Table 2.2.

Table 2.2: Summaries of two theories that account for culture and its influence on motivation

Geert Hofstede's cultural dimensions
Geert Hofstede's research into cross cultural psychology has been extremely influential (Latham, 2011). Hofstede proposes four key dimensions in which national cultures can be graded and which he suggests are critical for employers to understand about their country of operation. These are power distance [1], individualism [2], masculinity (alternatively known as quantity *vs*. quality of life) [3] and uncertainty avoidance [4] (Hofstede 2001). Each dimension is a scale and represents the degree to which a country's inhabitants are individually [1] likely to accept and consider inequality in power as normal, [2] the degree to which an individual promotes their own as opposed to group interests, [3] whether traits such as assertiveness, ambitiousness and competition as opposed to quality of life, interpersonal relationships, fairness and equality for the disadvantaged are valued, and [4] the degree to which people feel comfortable with lack of structure, clarity and predictability. Critics of Hofstede's national classifications argue they are informed by an assumption of stable and uniform national characteristics which are in fact likely

to be more dynamic. Hofstede has argued instead that it is the durability of cultures, as represented by scores on his dimensions, in the face of societal change that are of interest (Hofstede and Jan, 2005).
Cognitive polyphasia
Jovchelovitch and Gervais have explored how it is possible to simultaneously maintain different cultural frameworks and value systems in their research on the concept of 'cognitive polyphasia' among migrant Chinese populations in the United Kingdom (Jovchelovitch and Gervais, 1999). According to this theory, it is possible to simultaneously draw on separate and often contradictory sets of knowledge (in this case Chinese and western biomedical knowledge) depending upon the context of a given behaviour. These authors argue that individuals' behavioural motivations are influenced by more than one value system, particularly in contexts of displaced and re-locating communities.

The influence of a dynamic working context on work motivation

The influence of the changing nature of the working context on motivation has also been researched. For example, in Uganda as noted above, there has been structural reform in the health system involving decentralisation of coordination and management (Kyaddondo and Whyte, 2003). With workers needs seen as dynamically reacting to workplace change, strategies that embrace the perspectives of workers when seeking to understand their satisfaction and motivation have been encouraged (Ssengooba et al., 2007). Indeed, recently, calls have been renewed for increased research focus on social and relational context as well as person-centric influences on work motivation (Kanfer et al., 2017).

2.3.6 Work motivation: conclusion

The above sections have introduced some of the key concepts in work motivation theory that are relevant to the study of CHW work motivation such as; self-efficacy, outcome expectancy, intrinsic and extrinsic motivation and the important distinction between worker satisfaction and motivation. The section has also recognised the need for a fuller examination of the role played by context in enquiry into worker motivation to complement more person-centric focus. For instance, social cognition theory has been criticised for a tendency to assume universal drivers of behaviour (Hepburn, 2003) while needs theories tend to lack specificity when predicting the conditions under which a particular need will be most apparent (Haslam, 2004). In the next section the approaches taken to the study of CHW motivation are presented. This includes an appraisal of approaches designed to improve CHW motivation.

2.4 Community health worker work motivation

A brief review of previous empirical work on CHW motivation is presented in this section. The first sub-section concerns the complex range of influences that determine why CHWs volunteer, and material inducements to work including the durability of beliefs regarding future payment. The second sub-section explores non-financial motivators with a particular focus on the role played by the community and the work environment. The third sub-section explores the influence of gender, and the fourth, what has previously been done to influence CHW motivation. The section concludes with a rationale for why approaches seeking to influence and understand CHW motivation are likely to remain partial unless operating within a framework that considers broader social and contextual dynamics. Evidence from the literature suggests these are critical drivers of CHW motivation. Literature is drawn on from a variety of settings but with a focus on studies from Uganda.

2.4.1 CHW volunteerism, status and the desire for improved material circumstances

Ugandan CHWs, the VHTs, are volunteers. Volunteerism has been a focus of CHW motivation research enquiry. A common theme across the literature based on qualitative testimony of CHWs is that, where CHWs are volunteers, they still often see their role as income generating (Alam et al., 2012, Maes and Kalofonos, 2013, Brunie et al., 2014). The desire to be a volunteer is enhanced by public recognition, status and standing and may be influenced by gender (see below) (Kok et al., 2015b). Elevated status can also enhance a sense of altruistic drive and closeness with the community (Brunie et al., 2014, Banek et al., 2015, Kok et al., 2015a). This finding is echoed by studies that find a link between social prestige and CHW motivation and performance (Gopalan et al., 2012). For instance a study in Tororo district, Eastern Uganda, found that VHTs were motivated by becoming someone important in their community and perceived the achievement of this end as contributing to their social mobility (Banek et al., 2015). This was linked to the perception that improved status would expose them to other benefits such as in-kind payments and reciprocal favours. Other Ugandan findings also support VHTs positioning themselves for future opportunities to improve their material circumstances and livelihoods by virtue of their status: this time in Mbarara and Bushenyi districts in southwest Uganda (Ludwick et al., 2014).

Banek et al (2015) found that CHW motivation could wane when expectations of the value of the role, its status and the perceived benefits associated were not realised. These findings

echo those of other CHW studies that suggest CHW motivation is subject to a combination of influences informed by altruism and status derived from peers, the community and health system (Bhattacharyya et al., 2001, Rahman et al., 2010, Ludwick et al., 2014, Banek et al., 2015).

The findings from empirical research presented above suggest that being a CHW and being motivated to work as a CHW defy straightforward classifications. CHW motivational processes are complex with regard to the desire for compensation and opportunities for improving one's livelihood (Brunie et al., 2014). Understanding motivational processes can also be methodologically challenging. It has for instance been noted in the literature that in Uganda the word 'motivation' is colloquially understood as a form of material inducement to perform one's work role (Kimbugwe et al., 2014). Seeking CHW perspectives on their 'motivation' in this setting clearly requires care to ensure researcher and research subject have a common understanding.

2.4.2 Community health worker relationship with the community and health system

The connection, level of trust and collaboration between CHWs and both their community and the health system have been shown across the literature to be critically important to CHW motivation (Willis-Shattuck et al., 2008, Kok et al., 2016). Several reviews have noted the importance of appreciating how embedded CHWs are in their communities, how CHW livelihoods are inextricably tied to fellow community members and that programmes must do everything they can to strengthen and support this relationship (Bhattacharyya et al., 2001, Campbell and Scott, 2011, Banek et al., 2015). The importance of good communication and respect from the health system, manifesting especially in respectful and supportive communication with health facility staff and supervisors, has also been recognised (Hill et al., 2014, Kok et al., 2016).

Several studies have highlighted how lack of transport means and poor drug and equipment supplies can lead to dissatisfaction and CHW demotivation (Stekelenburg et al., 2003, Lehmann and Sanders, 2007, Gopalan et al., 2012, Brunie et al., 2014, Kok et al., 2015a). Brunie's work in Uganda highlighted how VHTs often have to weigh up the cost in time and material resources to travel in order to collect the drugs they distribute (Brunie et al., 2014). These findings are consistent with recent reviews of the evidence regarding the effectiveness of CHW strategies that find impact is mediated by the reliable supply of equipment, drugs,

transport allowances and support and supervision (Perry and Zulliger, 2012, Kok et al., 2015a). These reviews suggest that the lack of these critical features of a functioning CHW strategy, especially when they have been promised, can lead to sub-standard levels of motivation and performance.

There is also evidence to support the motivation and commitment of health workers being improved through personal development and knowledge gain (Rahman et al., 2010, Kok et al., 2015a), their sense of the value of the work and the programme or organisation they are working for (Gopalan et al., 2012, Campbell and Cornish, 2012), and the feasibility of their work tasks in terms of workload and their own efficacy (Franco et al., 2004).

2.4.3 Gender

Gender is increasingly recognised as an important influence on the performance and indeed motivations of CHWs (Kok et al., 2015a, Kok et al., 2015b, Raven et al., 2015, Musoke et al., 2018). For instance, it has been noted that in sub-Saharan Africa, women are more likely to take and remain in unpaid health focused roles due to the lack of alternative, paid work and pervasive beliefs that caregiving is a female role (Maes and Kalofonos, 2013). A recent systematic review of the influences on CHW performance identified gender roles and norms as a key aspect of the socio-cultural influences on CHWs in their community context (Kok et al., 2015b). The main spheres of influence related to:

- Gender based community preferences for CHW services delivered by either male or female CHWs that may influence service uptake and therefore performance. For instance, in Afghanistan women were not expected to interact with men outside of the family so engagement with male CHWs was considered inappropriate (Root and van Wyngaard, 2011). This was also the case in Guinea where only female CHWs could engage women in the context of family planning (Diakite et al., 2009) and in Ghana where a higher proportion of male CHWs was cited as a potential limitation of the effectiveness of a maternal and child health programme (Hill et al., 2008).

- Gender based assumptions of what a CHW role meant and required leading to either increased attractiveness of the role, likelihood of remaining in role or indeed prevention from becoming a CHW. For instance, in Kenya, male volunteer CHWs found they could not fulfil their financial responsibilities and dropped out of the CHW programme more frequently than female CHWs (Olang'o et al., 2010). The same study found that gendered perspectives related to female 'duty' to assume caring roles and males' perceived lack of

necessary caring capacities influenced female CHW retention and male drop out respectively (Olang'o et al., 2010).

Few studies exploring CHW performance through a gender lens in Uganda were found in the literature search. One notable, recent exception was a study by Musoke et al (2018) that utilised the qualitative 'photo-voice' methodology to explore gendered VHT work experiences (Musoke et al., 2018). The findings from this study, drawing on images produced by and discussed with a sample of ten VHTs (five female and five male) in Wakiso District (bordering Kampala to the north-west), resonate with those from Kok et al (2015b). Musoke et al (2018) found that despite VHTs ostensibly performing the same role, in practice they engaged in different types of work contingent upon their gender. For instance:

- Females sought care from female VHTs and males from male VHTs.
- Male VHTs, due to their more frequent bicycle and motorbike ownership, were viewed in the community as preferable contacts in a health emergency requiring transportation to the health facility than less mobile female VHTs. Male VHTs were also viewed as better able to take up roles requiring more movement such as supervision and community mobilisation.
- Male VHTs were more likely to take on physical tasks such as cleaning wells while female VHTs tended to be more readily available, given their relative lack of mobility (see previous point), to respond to local problems.

While these gender based factors were not explicitly related to work motivation in the literature, they are nevertheless important considerations when appraising the 'extra role' influences on CHW performance. Indeed, consideration of the influence of gender has been recommended for programme designers and researchers interested in improving and understanding CHW performance (Kok et al., 2015b). In response to this recommendation, where appropriate and feasible, gender based analysis relating to VHT work motivation is reported in this PhD.

2.4.4 Approaches taken to improve CHW work motivation

Strategies to influence CHW work motivation have to date tended to rely on the provision of specific interventions and often packages of incentives (see for instance Bhattarcharya et al 2001 and Colvin, 2014). They tend to emphasise the individual worker's cognitive response to their working, social and cultural context. Employment conditions and other contextual

factors have, on occasions, been accounted for but usually in terms of how they are perceived by the individual. Worker motivation is typically viewed as a process that occurs within the individual where incentives influence intrinsic (commonly seen as values) and extrinsic (seen as individually represented attitudes to contextual factors) components of motivation. In some reviews motivation is viewed as both an outcome of performance and a contributor to it (Kok et al., 2015a). That is, if a worker is motivated they perform and if they perform they feel motivated. This can result in complexities and confusion around motivational outcomes with, on occasions, some ambiguity around whether studies are examining motivation to perform as a CHW or to be a CHW. Nevertheless, it is generally acknowledged that the motivation of CHWs is subject to a complex interplay of individual, group, work place, cultural and societal influences and that there is unlikely to be an optimum approach to influencing it that is transferable across contexts (Glenton et al., 2010, Kok et al., 2015b).

In this section two broad types of incentive based approaches are discussed; financial and non-financial. On occasions both have been employed together. Grouping incentives by these categories has been the conventional approach taken across the incentives literature (Bhattacharyya et al., 2001, Hicks and Adams, 2003, Mathauer and Imhoff, 2006, Colvin, 2014).

Financial incentives

The merits of the provision of material incentives in the form of financial rewards for improving CHW motivation is contested in the literature. For instance it has been argued that introducing financial rewards may alter the social standing and community respect for the CHW role (Glenton et al., 2010). Linking performance with financial reward, or even the perception that this is the case, may not be in tune with the values of the country in which the programme is operating (Mueller et al., 2005, Glenton et al., 2010). In addition, maintaining funding for the payment of financial incentives may be irregular or stop altogether and even when supplied, the amounts paid may not be considered sufficient (Glenton et al., 2010, Ludwick et al., 2014). These findings have led to recognition that significant political will and sustained financial resources are required to effectively scale up financially supported CHW programmes (Singh et al., 2015).

Despite these challenges there are data that suggest introducing performance based financial incentives can lead to improved CHW performance. For instance, in Iran

improvements in infant and maternal mortality rates have been attributed in part to salaried and financially incentivised CHWs (or 'Behvarz') (Asadi-Lari et al., 2004, Mehryar, 2004). While in India, the Indian Accredited Social Health Activist (ASHA) programme, where ASHAs receive financial incentives for specific tasks like encouraging facility based deliveries, has reportedly achieved an increase of 8% (from 29.8% to 37.8%) in facility based deliveries (Lim et al., 2010, Singh et al., 2015) (NB: some commentators have argued these findings should be interpreted with caution based on methodological shortcomings such as the sample size (Das et al., 2011)). Despite these results, Singh et al (2015), in their analysis of five different models of financial support for CHW programmes, caution that when some specific performance activities are incentivised but more general activities are not, CHW focus often turns to those that carry a financial incentive. The evidence appears to suggest that when CHW tasks are simple, financial incentives can be motivating and lead to improved performance. When CHW tasks are more complex and involve multiple behaviours that are susceptible to a range of influences, financial incentives can result in unintended consequences. Examples are over-prescribing or over-treating if financially incentivised by prescription or treatment targets (Dieleman et al., 2009).

WHO guidelines suggest payment is necessary for the long term sustainability of health programmes which utilise CHWs (WHO, 2008b, Glenton et al., 2010). The moral argument for remunerating CHWs for their often demanding and time consuming work has also been made (Maes et al., 2010, Strachan et al., 2012). While there is a distinction between pay-for-performance incentives and remuneration, the moral argument still holds that some form of financial incentive is preferable to none in the absence of CHW remuneration. Some argue that, if implemented, emphasis should be on the reliability of payment rather than the amount or the design of payment system (Huang and Van de Vliert, 2003, Mueller et al., 2005). Others stress that the key emphasis should be on which performance activities to incentivise lest those that are not incentivised are neglected (Glenton et al., 2010, Singh et al., 2015). Indeed Singh et al (2015) argue that programmers should decide whether to financially incentivise or not rather than adopting a partially financially incentivised strategy.

Non-financial incentives

Non-financial incentives have also been proposed as critical components of any package of interventions designed to motivate and retain CHWs (Bhattacharyya et al., 2001, Mathauer and Imhoff, 2006). Strategies have commonly involved community based activities and

organisational strategies. Strategies aiming to address community and health system connection are discussed here.

Examples of community focussed strategies include; providing greater links to the community to foster increased community esteem and worker pride, improving communication and rewarding workers for creating these links (Franco, Bennett, Kanfer, & Stubblebine 2004). It has also been suggested that the following may improve CHW motivation; involving the community in CHW selection, goal setting, management and in designing incentive packages, promoting status of CHWs in the community with visible symbols such as uniforms and badges, fostering links between CHWs and established groups in the community such as youth groups or churches, utilising the health information collected by CHWs to promote the role of the CHW and the effectiveness of their activities, and establishing committees or associations of CHWs or facilitating their representation on local health committees (Bhattacharyya et al., 2001, Campbell and Scott, 2011, Haines et al., 2007, Strachan et al., 2012, Glenton et al., 2010).

Despite recognition of the importance of community support for CHWs, and the potential effectiveness of community based strategies for improving CHW motivation, there is currently little evidence based data on community level interventions and their impact on CHW motivation and performance. Community health worker motivation and especially community perspectives regarding community based programmes led by CHWs are understudied (Strachan et al., 2012, Banek et al., 2015).

Several approaches focused on what the health system can do to improve CHW motivation have been implemented. These have included; continuous or on-going skills development and training (Bhattacharyya et al., 2001), provision of clear role descriptions with the beneficial impact on self-reported worker confidence reported in Indonesia (Dolea and Zurn 2004), training, encouraging and incentivising health facility staff to interact with CHWs in a way that acknowledges their specific skills, experience, value and potential (Bhattacharyya et al., 2001), and creating a positive working environment (Jaskiewicz and Tulenko, 2012). While supervision is also commonly suggested to be motivating for CHWs, there are no known empirical studies that explore this link (Hill et al., 2014).

The power of a given incentive - financial or non-financial - to exact an increased level of performance from a worker has been seen as a function of both the degree to which the incentive is perceived to satisfy a worker's needs and how important the satisfaction of those

needs is to the worker (Mpembeni et al., 2015). Needs satisfaction theories have typically driven the provision by employers of the appropriate work conditions and tools for role performance and maintenance (i.e. retention) (Haslam, 2004). Along with social cognition approaches, this strand of motivational theory has been particularly influential in the context of CHW motivation where the focus has predominantly been on finding the right match between incentives and worker needs (Colvin, 2014). This focus has seldom been accompanied by scrutiny of the impact of social or contextual factors on the generation of these needs (Hicks and Adams, 2003, Mathauer and Imhoff, 2006, Glenton et al., 2010).

2.4.5 Community health worker work motivation: conclusion

Due to the range of complex influences on health worker motivation, it has been recognised that theoretical frameworks that can guide the design and strengthening of programmes are required (Franco et al., 2002, Kambarami et al., 2016). Such frameworks also enable the synthesis of lessons regarding effective strategies through the harmonisation of terminology (Michie and Johnston, 2012). The need for a common framework seems particularly apparent for efforts to motivate CHWs given the lack of empirical evidence regarding intervention design features that are effective in low income settings (Kok et al., 2015a). More dynamic theoretical models are required that can respond to the heterogeneous nature of health systems and their goals, communities and their needs and the often fluctuating support provided to CHWs by both (Standing and Chowdhury, 2008, Turinawe et al., 2015).

The account of research into CHW motivation strategies presented in this Chapter has demonstrated how previous work has tended to rely on individually focused conceptualisations of the process that drives motivation. Often based on needs theories and distinctions between incentives designed to appeal to intrinsic and extrinsic motivation, the addition of a framework that takes specific account of the social, group and community processes that inform their contextually influenced effectiveness might be beneficial. The social identity approach (SIA), it is argued in the following section, represents a good fit for this task.

2.5 The social identity approach

The social identity approach (SIA) is a term coined to describe social identity theory and social categorisation theory. A bank of empirical work and evidence based practices have been developed through the thirty or so years of the approach's development (Haslam, 2004, Hornsey, 2008). This section explores the key components of social identity theory and social categorisation theory. These components will be used to later justify why the SIA has been drawn on to design the inSCALE interventions that aim to influence the work motivation of VHTs in Uganda and to explore, with qualitative methods, this work motivation.

2.5.1 Social identity theory

Social Identity theory (SIT) emerged as a potential bridging concept between individual cognition, collective influences and behaviour from European social psychology in the 1970s (Hogg and Terry, 2000, Hogg and Ridgeway, 2003). SIT was developed originally using data from Tajfel's *minimal group studies* that sought to understand the least or 'minimal' conditions under which someone would discriminate in favour of their own perceived group and against another perceived 'out group' (Haslam, 2004). Those conditions amounted to random assignment to groups while being told group allocation was due to performance on a task as menial as estimating the number of dots on a screen. Participants were found to act in accordance with their perceptions of the best interests of the group (Tajfel, 1972). Individual difference and economic choice paradigms of human behaviour proved inadequate when it came to interpreting these results given favouring a random group affiliation ran contrary to accepted truisms of individual self-interest. This led Tajfel to explore the underlying reasons for these results. He concluded that they were driven by the 'meaning' an individual found by virtue of their group assignment, the distinction this brought and the resultant drive to maintain and amplify a positive sense of the distinction between this group and other groups (Tajfel, 1972). Tajfel argued that categorisation into a group meant that a discrete *social identity* that held value for the individual was established. Seeking and maintaining the *positive distinctiveness* of this group, the central component of SIT, then became important for these individuals (Haslam, 2004, Tanis and Postmes, 2005, Haslam et al., 2008, Turner and Reynolds, 2010, Lewis, 2011).

For Tajfel, identity born of association or even allocation to a group was comprised of three key components; categorization into a group, a sense of emotional attachment to that group and some kind of assessment as to what significance group membership or association holds.

He defined it as '*the individual's knowledge that he* [or she] *belongs to certain social groups along with some emotional and value significance to him* [or her] *of this group membership'* (Tajfel, 1972) *(*p. 31).

SIT evolved from Tajfel's initial conceptualisation. Social identity researchers asked the question of why, in real world settings, people identify with one or a combination of groups in preference to others. The key, they suggested, is group attractiveness or relevance, which they called identity *salience* (Oakes et al., 1991). Thus according to SIT, when one identifies with a group, and membership is sufficiently *salient* to override influences based on the individual, one's behaviour becomes subject to group norms and what they are influenced by in the setting (Lewis, 2011). One therefore has multiple identities, both social and individual, that are often simultaneously cognitively regulated or 'turned on' in response to the situation (Howarth, 2002). The question of why one assumes such social identities has been demonstrated to depend upon timing as well as the perceived relevance of the social identity to the individual (Tanis and Postmes, 2005). If the timing is right, and the group identity is relevant, then the goals of the group as perceived by the identifying individual become self-goals and viewing oneself favourably in comparison to other groups by virtue of group membership and association becomes paramount (Haslam, 2004). Thus it is not a choice between serving self or group goals but instead the pursuit of both serve the goals of the self (Tajfel and Turner, 1979, Turner, 1982). Group goals become self-goals.

An important feature of SIT is the explanation within the theory for how identifying group members achieve or maintain *positive distinctiveness*. Tajfel and Turner proposed that beliefs about groups and their relationship to other groups inform whether identifying members seek to move between groups, compete with other groups, or creatively seek to positively redefine perceptions of the group (Hogg and Ridgeway, 2003). When ones social group is considered to be *permeable* or that one can disassociate with it, and the group has less than optimal status, one can engage in *individual social mobility* through moving to a group with superior status. However, when one's group boundaries are seen as *impermeable* or that one cannot disassociate with it, and the group has less than optimal status, one must engage in *social change* or activities designed to improve the collective status of the group. Social change is proposed to occur in one of two ways;

1   Where status is low and perceived as warranted and conditions are viewed as unlikely to change, drawing similarities between in-group features and those of higher status out

groups in order to raise in-group status. Alternatively a lower status comparison out-group may be sought.

2   Where status is low but conditions are seen as possible to change or that low status is unwarranted, conflict and antagonism towards relevant out-groups may occur.

Both social change approaches result in reinforcement of the out-group's inferiority. Individual social mobility also results in acceptance of the out group's inferiority but by simply switching the former in-group to the out-group, and assuming the identity of a higher status group (Ellemers et al., 2004, Haslam, 2004).

These modes of maintaining positive distinctiveness are critical to SIT as a social psychological theory. Indeed it is proposed that at its heart SIT is about the collective social power of the group. In his paper (with colleagues) where he articulates the late John Turner's vision for SIT, and indeed social psychology as a discipline, Haslam argues that SIT must be understood in terms of its' political dimensions where 'social change' through collective action may be the sole act of power available to the powerless (Haslam et al., 2012).

SIT potentially provides a framework for understanding the motivation of CHWs as they seek to improve their individual and collective agency or power. Central to SIT is that the behaviour of an individual is guided by the social identity of the group or groups to which they identify as a member. Through the theory, groups can be defined less by obvious characteristics (e.g. uniforms, gender, language) and more by the impact any of these features have on a sense of unity as a group – that is their psychological meaningfulness or 'we-ness' (Haslam et al 2004, p. 88, Haslam et al 2008, p. 6) and, critically, the status they confer (Haslam, 2004, Haslam et al., 2008). Thus the theory allows for exploration of how any inputs – such as incentives designed to motivate CHWs – may be viewed as meaningful for a group with which an individual identifies.

In order to understand how such an enquiry might be formulated it is necessary to explore the development of the theory since Tajfel's early work. That is, the process through which group members internalise the group's social identity as part of their self-concept and how one, for instance, may become part of a particular group instead of an alternative. The task of unpacking this process is what drove the development of self-categorisation theory (Turner and Reynolds, 2010).

2.5.2 Self-categorisation theory

SIT sought to address the question of why people act in favour of groups they identify with. Self-categorisation theory (SCT) sought to understand why people identify with groups and whether there is a group process underpinning this that is 'psychologically real' (Turner and Reynolds, 2010) (p. 19). Some refer to the shared ideological and theoretical basis of the two theories, while acknowledging the intergroup focus of SIT and intragroup focus of SCT (Hornsey, 2008). For Turner (1982), 'social identity is the cognitive mechanism that makes group behaviour possible' and it thus, he reasoned, warranted a fully developed theory (Turner, 1982) (p. 21).

The degree of categorisation, or readiness to identify with a group, has been viewed as a function of the degree to which one sees similarities between oneself and the group. That is the 'fit' between the perceived values of the group and one's own values. The greater the perceived 'fit', the greater the absorption of group identity into the self-concept and the likelihood of behaving in accordance with group based behavioural norms when that social identity is salient (Oakes et al., 1991, Lewis, 2011). The key concept here is of *meta-contrast* or where the difference between members of a self-category are perceived to be less than the differences between that category and other possible group categories (Hornsey, 2008).

The adoption of group based behavioural norms is suggested to take place through a process of self-stereotyping (Oakes et al., 1994). Where SIT posits that identifying group members favourably compare themselves with a stereotypical view of a comparison out-group in order to maintain in-group esteem, SCT suggests that the same homogenous or stereotypical view is held regarding one's own group (Haslam, 2004). That is, having categorised oneself as a group member, one comes to define oneself in terms of stereotypical attributes of that group and to see oneself as interchangeable with fellow group members. This process has been referred to as *depersonalisation* (Turner, 1982). Similarities between in-group member's 'perceptions, motivations, values and goals' are highlighted and differences tend to be glossed over or ignored (Haslam, 2004) (p. 85). According to SCT, once one identifies with a group, an on-going process of interaction with other group members to establish group norms, beliefs and behaviours ensues. As social identity becomes salient one's notions of group stereotypes and norms become a reference for one's own behaviour and for normalising actions and activities (Abrams and Hogg, 1990, Oakes et al., 1991).

The central premise of SCT is that when individuals describe or categorise (i.e. identify) themselves as members of a certain self-category, their behaviour is driven by their notions of appropriate or typical category behaviour. When this behaviour occurs is proposed to be subject to the *salience* of that particular identity at the time (Oakes et al., 1991). Identity salience is an important concept within SCT. It is subject to situational influence. For instance, a group of micro-biologists may sit together in a room otherwise occupied by nuclear physicists and be seen as categorically different but when the micro biologists and nuclear physicists together leave the building and mingle with members of the public their collective identity as scientists becomes more salient. As salient self-categories influence behaviours, behaviours can be seen as a context based and dynamic outcome of identity (Lewis, 2011).

As noted above, Turner (1982) referred to the social psychological process underlying social identity salience as 'depersonalisation' (Turner, 1982). That is where the self comes to be perceived as interchangeable with other 'in group members'. If identity as a member of a group becomes a relevant social self – category then others perceived to be members of that category become reference points and important sources of information regarding norms and behaviours. They will be sought out, consulted and listened to regarding activities perceived to be in the shared interests of this collective (Haslam, 2004). As the group defines one's sense of self, by acting in the perceived best interests of the group one is also acting in one's own self-interest (Haslam et al., 2008). Views and behavioural norms are no longer experienced as subjective but instead are transformed into collective notions of appropriate behaviour that can become reified by individuals who ascribe to that categorisation (Haslam et al., 1997, Haslam, 2004).

The self is changeable and we can be different people in different contexts (Onorato and Turner, 2004). While on occasions we may adopt behaviours in our self-interest, and on others in terms of group-interest, both, according to SCT, are actually self-driven as identification with a group leads to adoption of group goals as personal goals (Turner and Reynolds, 2010). In the context of organisations, should these behaviours match the organisation's goals then a focus on fostering the collective sense of workers, and their development and acceptance of behavioural norms, represents a potentially fruitful means through which to motivate work based performance (Haslam et al., 2000).

The application of principles of both social identity theory and social categorisation theory (thus the social identity approach) to the task of worker motivation is explored in the next section.

2.5.3 Social identity and work motivation

The SIA has been applied to work groups and organisations (Ashforth and Mael, 1989, Ellemers et al., 2003, Haslam et al., 2014, Steffens et al., 2016). The impetus for this application has been the quest to understand how a work culture, organisation and even work groups can influence the behaviour of employees (Haslam, 2004). There has been increasing recognition that organisational productivity is more than the summed output of individual employees. Instead the psychology of employees is a function of both individual and social dimensions. If a worker is to identify with their organisation then they must perceive a synergy between themselves and the organisation. Group or organisational membership therefore becomes a part and indication of who one is and the greater the degree of identification the greater the likelihood one is to act in accordance with the group's perceived norms and typical *modus operandi* (Van Knippenberg, 2001, Ashforth et al., 2008).

In the section on SIT above, the central aspect discussed concerned the drive to establish and maintain the *positive distinctiveness* of one's group. That is, once an individual identifies with a group, actions are taken to maintain or improve the esteem in which that group is held by oneself and as one perceives it, others. The challenge for an employer or organisation is to understand how and whether workers categorise themselves as members of the organisation or sub units of it (e.g. work group), whether the values and behavioural norms of the worker align with those desired by the employer, and how, if possible, the employer or organisation can positively influence these values and norms (Ellemers et al., 2004).

In the context of work motivation, the key theoretical insight offered by the SIA is how the needs of the worker, as informed by their self-categorisation, influence their motivation to exert and maintain their effort in the pursuit of organisational goals (Franco et al, 2002). Where other needs based theories of motivation have, as explored above, conceptualised needs as occurring on a hierarchy such as proposed by Maslow, Alderfer or Herzberg, the SIA instead conceptualises the prioritisation of needs as contingent upon the salience of different levels of self-categorisation. That is, by what a worker in a given situation will answer to the question of 'who am I?' Depending on the situation the answer may refer to self as a unique individual, according to 'group based self-definitions in terms of a salient

social identity' (Haslam, 2004. P. 67), or to a more abstract view of oneself as a member of the human race or animal kingdom. From a work motivation perspective, each of these different levels of self-categorisation will be accompanied by a different set of needs and motivations. If identifying as a member of the organisational collective, according to the SIA, workers will be motivated to take actions that promote the positive distinctiveness of that collective. To the degree that these actions are consistent with organisational goals, workers might be expected to demonstrate work motivation (Van Knippenberg, 2001).

There is empirical evidence for the theoretically proposed link between organisational identification and work motivation. This has been established through analyses of quantitative work motivation and social identification measurement scales. For instance:

1. A study of work attitudes of university employees found a relationship between organisational identification and a 'work involvement measure' (i.e. 'I am always prepared to do my best') (r = 0.27, p < 0.01) (Van Knippenberg and Schie, 2000). The authors concluded that that 'although only a cross-sectional study in which all data were gathered with the same questionnaire, this does corroborate the proposition that identification may be associated with the motivation to exert effort on the job' (p. 363).

2. In a study of two samples of German school teachers, identification with their professional group was positively associated with work motivation (r = .37, p < .01) (van Dick and Wagner, 2002).

3. In two surveys of call centre workers in Germany, that drew on subjective measures of work motivation and organisational identification, it was found that high organisational identification was positively associated with higher work motivation (r = .39, p<.01) (Wegge et al., 2006).

Other studies have demonstrated that socially identifying employees are more likely to seek and receive peer support leading to lower stress, burnout and inclination to leave (Avanzi et al., 2015). In addition, congruence between identity as a care provider and organisational identification has also been found to lead to greater work motivation (Bjerregaard et al., 2015), and the connection between organisational identification and work performance has been linked to the drive to act in the perceived interests of the group (Brown et al., 2017).

No empirical evidence was found exploring links between social identification and CHW work motivation. This constitutes a gap in the literature.

2.5.4 Criticisms of the social identity approach

The key criticism of the social identity approach is that it neither accounts for, nor pays sufficient attention to, the influence of the social ecology of the individual on behaviours and, as a result, is socially reductionist (Wetherell, 1996, Billig, 2002). Indeed one eminent critic has suggested Henri 'Tajfel, through his theory, contributed more to the individualisation of the social than he did to the socialisation of the individual' (Farr, 1996) (p.10). This criticism runs contrary to Tajfel's goal of producing a non-reductionist theory that understood the individual's behaviour as a function of the socio-cultural and historical context (Dashtipour, 2012). The criticism of the Social Identity Approach being socially reductionist appears to be based on three main arguments related to how the theory has been developed. These are:

1. Much of the evidence for the social identity approach has been generated through laboratory based experiments utilising populations, such as male adolescent students from high income settings, with features that arguably lack transferability to other populations and settings (Dashtipour, 2012).

2. Most enquiry into the theory has focused on what can be assessed at an individual level and generalised to populations. This is instead of looking at group characteristics such as, for instance, qualitatively exploring shared or collective or indeed social representations of identity (Howarth, 2002). By seeking methodologically to unearth categories of identity perceived at an individual level, the argument is that the social dynamism and complexity of an individual's interaction with the social field that necessarily precedes any reflection on or categorisation of identities is diminished or ignored (Brown and Lunt, 2002).

3. Despite the important formative role played by power and social mobility in the development of the SIA according to its early proponents, these critical influences on individual behaviour in the wider, social ecology have been insufficiently and, on the whole, uncritically explored. Instead the rationality of the individual as an agent of change is privileged, while the myriad of social, political and economic factors that may be influential are relatively underplayed (Brown and Lunt, 2002).

In the next section, the rationale for drawing on the SIA while seeking an insight into the work motivation of Ugandan CHWs is presented. This includes a response to the key criticisms of the theory presented in this section.

2.6 The case for drawing on the social identity approach to understand and improve CHW work motivation

The SIA proposes that in many settings, including organisational ones, people define their sense of self according to their group membership (Ashforth and Mael, 1989). The SIA accounts for the role played by context on this psychological process (Haslam et al., 1999, Hogg and Terry, 2000, Haslam et al., 2008). As noted above, motivational enquiry in the context of CHWs has, to date, largely focused on the provision of incentives. Understanding their impact and influence has commonly been informed by individually focused concepts from social cognition theories such as self-efficacy, goal congruence and intrinsic and extrinsic motivation (Colvin, 2014). Without a binding theory that can account for the dynamic nature of what work, context and incentives mean to an individual, an account of what actually motivates them is likely to be partial. The SIA offers an alternative framework for understanding what a particular incentive – be it a training opportunity, mobile phone, payment, community support or any other incentive – means in the context of being a member of an organisation or indeed a collective of workers such as CHWs.

The criticisms of the SIA outlined in the previous section are predicated on the assumption that the theory suggests categorisation is a conscious, cognitive process within the individual. This contrasts with the consistent emphasis within accounts of the theory that it is the absorption of collective goals into self-goals that drive behavioural response to identification with a given social collective (Haslam et al., 2000, Turner and Reynolds, 2010). Through exploring the conditions under which individuals define themselves as CHWs in terms of their self-concept, and how this categorisation evolves to incorporate changed circumstances (such as exposure to interventions designed to improve motivation), the circumstances where CHWs are motivated to act on their perception of group level behavioural norms may be understood (Ellemers et al., 2004). By positioning such enquiry within a critical social psychological framework – that is one which accounts for the broader political and ideological factors at play – an understanding of how CHW motivation is influenced by a multitude of variables in the settings where CHWs live and work may be gained.

Given the identified need to consider the range of personal, interpersonal and contextual factors at play when it comes to the motivation of CHWs, the SIA seems well placed to guide the development of interventions aiming to influence this motivation as well as understand their impact. In addition, along with empowerment, critical consciousness, social capital and

power, identity has been flagged as an important consideration when seeking an understanding of the impact of behavioural interventions in conditions of poverty (Campbell, 2003). For these reasons enquiry into CHW work motivation utilising the SIA is proposed to be a justifiable approach with the potential to produce important insights. The methodological importance of maintaining an emphasis on collective, social signifiers of identity and, from a critical perspective, positioning the results of the enquiry within the wider social ecology of the individual CHW and indeed the CHW collective is acknowledged. This emphasis is retained through the PhD.

2.7 Conclusion

As stated in Chapter 1, the purpose of this PhD is to examine Ugandan VHT's work motivation through the analytical lens of the SIA. Based on the evidence presented from the literature review, it is proposed that utilising the SIA for this purpose may lead to a more detailed and nuanced understanding of the contextual influences underpinning VHT motivation than currently appear in the literature. In so doing, the call for greater focus on contextual influence increasingly appearing in the literature may also be addressed (Brownson et al., 2009, Kane et al., 2010, Glanz and Bishop, 2010, Campbell and Scott, 2011, Strachan et al., 2012).

The SIA will be used as a supplement to, rather than replacement for, other theories that account for work motivation. Many of the motivational theories explained in this chapter are also drawn on to assist understanding of VHT work motivation. The specific ways in which this will be done is explained in the subsequent chapters.

3. Intervention development

The work for this chapter was conducted with support from colleagues on the inSCALE project as described in Chapter 1. The work is published as a paper (Strachan et al., 2015), which appears in full in Appendix 9.4 and has been summarised in a poster which appears in Appendix 9.5 (Strachan et al., 2016). Modifications and adaptations to the wording of the paper have been made but much of it remains as was published. The main alterations involved removing content related to the inSCALE study site in Mozambique and adding more detailed findings.

3.1. Introduction

In Chapter 1 the increasing focus on the utilisation of CHWs as key components of public health strategies was discussed. Alongside this discussion, the concern that scaled up strategies utilising cadres of CHWs are constrained in their effectiveness by CHW motivation, retention and performance was recognised. This included identification of the paucity of evidence for effective strategies currently available to counter these identified constraints. In this Chapter interventions designed to address this paucity are presented.

Basing behavioural interventions on a theoretical understanding of behaviour, and empirical data from the behavioural context, has recently been emphasised when seeking to design successful public health programmes (Brownson et al., 2009, Kane et al., 2010, Glanz and Bishop, 2010, Campbell and Scott, 2011, Strachan et al., 2012). The aim of this Chapter is to demonstrate how the Social Identity Approach (SIA), described in Chapter 2, in combination with data generated from formative research utilising qualitative interviews with Ugandan VHTs and stakeholders, was drawn on to inform the design of interventions to improve CHW motivation, retention and performance in Uganda.

Several methods were used during the intervention development process including reviews of the implementation context, stakeholder consultations, theoretical reviews and formative research. This Chapter reports on two of these: the review of theory presented in Chapter 2 and formative research. In line with the aims of the PhD the focus of the analysis and reporting presented in this Chapter relates to VHT work motivation and social identification and the intervention design features that led from theory and formative research findings.

The methods for the theoretical review appear in Chapter 2. The methods for the formative research are presented here.

3.2. Methods

There were two aims of the formative research. These were to understand the perspectives of VHTs and a range of stakeholders regarding:

1. VHT work motivation, retention and performance and what may influence it
2. The feasibility and acceptability of key components of two broad approaches to improving VHT work motivation, retention and performance. These related to community activities and the establishment of community level committees and the use of low cost mobile phones.

Later in the Chapter the design of the final interventions is described. Prior to formative research, the intervention approaches were far less specific. At that point the first intervention area related to community meetings and other community level activities that would involve the VHT and be participatory in nature. The second intervention area related to the use of low cost mobile phones by VHTs for a range of purposes such as staying in touch with peers and supervisors, sending reports that had to date been paper based, receiving performance based feedback and other communications designed to improve work motivation, retention and performance.

A full description of the process leading to inSCALE intervention design has been reported elsewhere (Frank and Källander, 2012, Källander et al., 2015a). A summary appears in Table 3.1.

Table 3.1: Process of identification and development of interventions

Step	Process
1	Identify interventions with the potential to improve the motivation, retention and performance of VHTs in Uganda by reviewing theoretical and empirical evidence, consulting with key stakeholders in the field and exploring the political and programmatic operating context. Select two broad intervention approaches through a series of workshops and develop a list of possible interventions within these broad areas
2	Conduct formative research with the key personnel who would be targeted by, and tasked with, implementation of the proposed interventions to: • Explore the barriers and facilitators to VHT motivation, retention and performance • Explore their feasibility and acceptability of the proposed interventions

3	Use theoretical and empirical evidence and formative research findings to select and design two interventions to be implemented and determine the implementation strategies

3.2.1. Study setting

The study was conducted in Uganda's capital, Kampala, as well as in two districts (Kiboga and Hoima) in the country's mid-western region. Within the Ugandan VHT programme the consistency of drug and commodity supply is often subject to donor assistance. Study sites with functioning supply chains were selected to reflect the inSCALE study sites which planned to provide drugs (Källander et al., 2015a).

3.2.2. Sampling

In-depth interviews (IDIs) and focus group discussions (FGDs) using a variety of methods were conducted with a range of target groups in Uganda. Five multi-lingual fieldworkers were recruited and trained for one week on the background to the research, the topic guides, data collection, recording and documentation, the principle of informed consent and the participant consent process, and the data collection schedule. The use of multiple respondent groups and methods allowed for data triangulation and ensured diverse viewpoints were captured. The respondent groups, methods and number and content of these research encounters are presented in Table 3.2.

Sampling was purposive, and for VHTs, stratified by proximity to supervising facility, use of mobile phones and network coverage as well the size of their community. VHT respondents were not sampled by sex though a mix of male and female respondents was targeted. The reason was that there was no *a priori* reason to predict influence on VHT testimony based on gender[11]. Caregivers of children below 5 years and male heads of household were stratified by size of community and proximity to a health facility. Supervisors were stratified by mobile phone network coverage (good or weak). The rationale for these stratification categories were that these groups were considered likely to provide differing perspectives. Respondents were identified and mobilised by Malaria Consortium research staff employed by the inSCALE project. No approached respondents declined or left interviews or FGDs. Interview numbers were set in order to recruit multiple respondents (at least two) in each

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[11] The literature related to gender based influences on CHW performance and presented in section 2.4.2 was not conducted until after the formative research data presented in this chapter was collected.

stratum and maximise the likelihood of data saturation. Provision was made to recruit additional respondents in the event that data saturation was not reached. I led daily reflective meetings with fieldworkers during data collection where issues were highlighted and the data discussed. These revealed that themes of response were emerging and, when multiple examples of each theme were identified, I took the decision that data saturation had been reached and additional research encounters were unnecessary.

Table 3.2: Respondent groups, methods and final number and content of research encounters

Method (number of encounters)	Respondents	Content	
IDIs (61)	VHTs (31 respondents), VHT supervisors (6), NGO and district personnel with experience in VHT programme implementation (6), local community leaders (6), caregivers of children below 5 years (6) and male heads of household (6)	VHT motivation and issues related to their retention and performance from different perspectives	Interactions between VHTs and the health system and community
FGDs (15)	VHTs (7 FGDs), supervisors (3), district personnel with experience in VHT programme implementation (2), local community leaders (1), caregivers of children below 5 years (1) and male heads of household (1)	Reactions to and perspectives on the proposed interventions from different perspectives	Perceptions and current use of mobile phones

3.2.3. Data collection and analysis

IDIs and FGDs ranged in duration from 45 to 120 min with FGDs comprised of between 4 and eleven participants with a mean of 8. IDIs and FGDs were conducted in January, February and May 2011. They were digitally recorded in local languages or English by fieldworkers. Pre-tested IDI and FGD topic guides were developed by myself and my supervisor to explore barriers and facilitators of motivation, retention and performance as well as experiences and attitudes towards potential technology and community-based interventions. See Table 3.2 for the content focus of the guides developed for each research encounter. See Appendix 9.6 for the topic guides used for the VHT IDIs. Informed consent of participants was taken in compliance with the ethical approval conditions of the project.

Audio recordings and fieldworker notes were used to produce 'expanded notes', in English, from what the respondent or respondents said with direct quotations used to illustrate the main points (Halcomb and Davidson, 2006, Hill et al., 2010). These were produced

immediately following each interview or focus group to allow for more accurate capture of the content while it was fresh. Each set of expanded notes were discussed with me or the Malaria Consortium research lead enabling rapid implementation of any feedback provided prior to the next research encounter.

Analytical induction, an iterative, inductive–deductive approach, was adopted as the analysis approach (Braun and Clarke, 2006). The original topic guides helped structure the thematic analysis, but scope remained for data to be generated in unanticipated content areas and for themes to emerge from the data (Braun and Clarke, 2006). *Expanded notes* from IDIs and FGDs were analysed systematically for key themes using a content analysis approach (Pope et al., 2000, Patton, 2001, Braun and Clarke, 2006) by hand and with the aid of Microsoft Excel and NVivo software.

3.3. Results

The results section explains how the theoretical review and formative research were used to guide the development of two interventions. The first Results section concerns the rationale for key emphases for the intervention design stemming from the theoretical review. The second Results section presents the results of the formative research and key intervention design emphases stemming from them. A description of the two inSCALE interventions appears at the end of the results section.

3.3.1. Theoretical rationale for key intervention emphases

The results of the theoretical review relating to the broad area of work motivation, CHW work motivation and the Social Identity Approach (SIA) have been presented in Chapter 2. This included a rationale for why the SIA should be adopted as the guiding theory for the development of interventions seeking to improve the work motivation of Ugandan VHTs. The results of the theoretical review were presented to the inSCALE study group who agreed that the SIA provided a potentially valuable framework for guiding the design of interventions aiming to influence VHT motivation alongside key elements of the social cognition approach.

The SIA was deemed by the inSCALE study group, based on the rationale provided by me, to represent an innovative approach to draw on when seeking to address the accepted constraints to scaled up CHW programmes of motivation, retention and performance. There are however many behavioural theories, and a case could be made for the adoption of

several alternatives to the SIA. The SIA was selected primarily in a response to a call for greater emphasis and sensitivity to the context of CHW work (Campbell and Scott, 2011) which ruled out a focus on, for instance, personality - an influential line of work motivation enquiry in the twentieth century (see Chapter 2) (Latham and Pinder, 2005). Endorsement of my nomination of the SIA was made by an experienced multi-country team tasked with being innovative and was based on several reviews and consultations (Strachan et al., 2012, Frank and Källander, 2012, Källander et al., 2015a).

The inSCALE study group supported my suggestion that if a link can be established between CHW motivation and the identification of individual CHWs with a collective CHW identity, then there may be a rationale for the development of simple, collective identity-focused interventions when seeking to influence CHW motivation at scale. Indeed, a focus on the development of interventions that appeal to the needs of CHW collectives in different contexts, and thus galvanise them *en masse* to perform the actions they perceive to be in the interests of the group with which they identify, may offer a cost-effective complement to the traditional strategy of creating an incentive package (Bhattacharyya et al., 2001, Mueller et al., 2005, Mathauer and Imhoff, 2006, Rahman et al., 2010, Colvin, 2014). The exploration of this possibility is the main concern of the PhD. This chapter focuses on the intervention design components informed by this perspective and formative research results.

Based on the rationale presented in Chapter 2 it was hypothesised by the inSCALE study group that VHT motivation will increase as a function of the relevance of the VHT social identity to VHTs and the resulting identification of VHTs with that collective (Haslam, 2004, Van Knippenberg, 2001). It is further proposed that work motivation is subject to the perception that the pursuit of the behaviours and activities required by the programme are in the collective's best interests (Van Knippenberg, 2001). Thus, if actions that promote the positive distinctiveness of the VHT collective are clearly communicated and understood, it is proposed that VHTs identifying with a shared social identity will be motivated to perform those actions (Van Knippenberg, 2001). Positive performance and retention is likely to follow to the degree that they are consistent with VHT perceptions of effective performance (i.e. it is worth it) and within the control of VHTs to influence and potentially achieve (Van Knippenberg, 2001, Haslam, 2004, Wegge et al., 2006). Thus, if the actions that promote the positive distinctiveness of the VHT collective are made clear by the programme environment (i.e. current VHT programme plus the inSCALE interventions in the current study), CHWs

identifying with a shared social identity will, it is proposed, be motivated to perform those tasks.
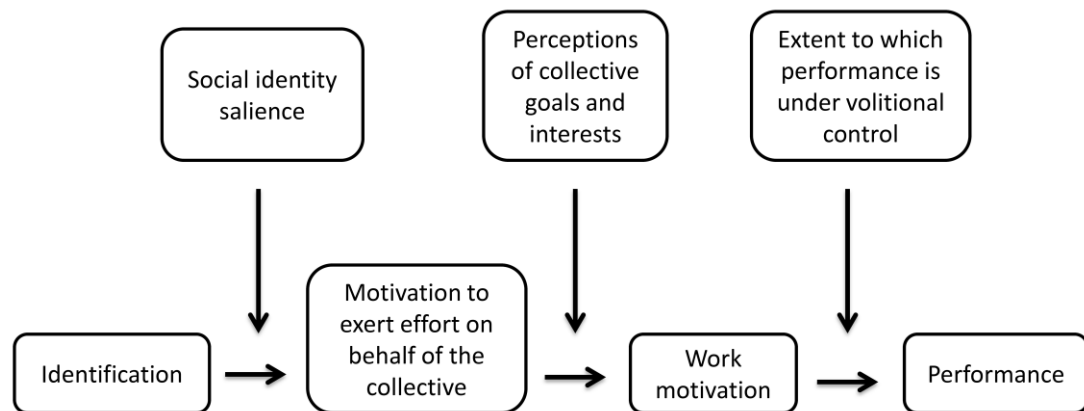
Figure 3.1: A social identity model of work motivation and performance (Van Knippenberg, 2001, Van Knippenberg and Ellemers, 2003)

The hypotheses described here are captured in a model of worker social identity, motivation and performance developed by Daan van Knippenberg and colleagues that is presented in Figure 3.1 (Van Knippenberg, 2001, Van Knippenberg and Ellemers, 2003). These hypotheses, along with the results of qualitative formative research with VHTs, have been used to guide the development of the two inSCALE interventions. In Chapter 6 the model is also used to guide the analysis of qualitative data gathered from associative interviews with VHTs in order to understand VHT identification with the VHT collective, motivation and performance and the influence on this process of the interventions.

Key findings from the theoretical review relevant to intervention design

From the results of the theoretical review, several key guiding principles for intervention design were identified. These are presented in Table 3.3 alongside a brief explanation (see Chapter 2 for the full review).

Table 3.3: Guiding principles for intervention design from the theoretical review

Guiding principle for intervention design	Explanation from the theoretical review
From the social cognition literature	
Promote: • correspondence between VHT's goals and those of the VHT programme • the value and effectiveness of VHTs • That valuable outcomes will stem from VHT work	Having individual goals that align with those of your employer (goal congruence), believing you can be effective in your work (self-efficacy) and believing that a valued outcome will result from work efforts (outcome expectancy) are recognised influences on work motivation from the social cognition literature

From the Social Identity Approach literature	
Stimulate a feeling of shared experience and collective identity among VHTs	People are more willing to identify as members of a collective and motivated to act in its perceived interests when they see: • the group's goals as compatible with their own • their own experiences as typical of that group
Promote the appropriate actions of a VHT and the link between taking them and achieving the goals of both the VHT programme and VHT collective	People identifying as members of a collective will seek to take the actions that positively distinguish that collective. If the actions VHTs are asked to take in their role are perceived as positively distinguishing and a behavioural norm for VHTs, socially identified members will be motivated to take them
Focus on what is within VHT's power to deliver	For the motivation to perform to translate into actual performance, performance outcomes need to be perceived as of value and within workers' control to achieve

3.3.2. Formative research results leading to a rationale for key intervention emphases

The formative research results are presented in thematic areas that most directly influenced the development of the interventions, namely *motivation*, *retention*, *performance* and *VHT work* challenges. Important issues considered likely to impact the feasibility and acceptability of the interventions are explored in thematic areas relating to *community issues and influence* and *mobile phone issues and influences*.

VHT work motivation

VHTs reported a range of factors that contributed to their motivation. VHTs explained that they were motivated by helping fellow community members, not wishing to let them down and gaining their trust, respect and appreciation. This was commonly attributed by VHTs to an altruistic drive.

> *The desire to change people's lives is what drives me*
> *(VHT IDI 8)*[12]

It appeared that validation and affirmation, feedback and respect from community members and health workers that supervised them was a major influence on VHT work motivation in

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[12] The results are presented with direct illustrative quotes from respondents. They are followed by abbreviations to indicate from which group they originated (supervisor, male head of household, caregiver for child below 5 years of age, community leader) and the number of the IDI or FGD. Interviews were numbered according to the chronological order in which they were conducted. This means that interviews of different types (e.g. VHTs or fathers) are not necessarily numbered sequentially.

addition to, and perhaps beyond, altruistic drives. A critical aspect of this was the status afforded them by virtue of their work; both during interactions with members of the health system and community members. That elevated status of the VHT role was contingent upon capacity and means to diagnose and treat community members with drugs was also acknowledged.

> *After becoming a VHT, I got well known to the health workers …so wherever I go I am recognised and this motivates me to continue serving as a VHT*
> (VHT IDI 31)

> *When I began treating young people in the community by giving them drugs it has earned me respect in the community … this makes me feel motivated and feel good*
> (VHT IDI 14)

VHTs also found learning through interactions with peers, community members and especially from the knowledge gained from their training and supervision, motivating.

> *I get a lot of wisdom and knowledge especially after being trained with words of encouragement*
> (VHT IDI 4)

The main motivational themes generated from the analysis of VHT interview data appear in Table 3.4.

Table 3.4: The most emphasised work motivation themes from interviews with VHTs

Theme	Illustrative quote
Help others and improve the health of the community	*My desire is to see my area benefiting …. I would love to see my village free of diseases* *(VHT IDI 6)*
Gaining community popularity trust and appreciation	*When some parents come and appreciate my work as a VHT especially after successfully treating their young children, I get courage* (*VHT* IDI 4)
Gaining knowledge	*The kind of information I would like to receive is anything that contributes to VHT knowledge… such information is motivating to me and helps me like my work* (VHT *IDI* 8)
Recognition, validation and feedback from supervisors and health staff	*Once I am told about how I perform, it will motivate me to keep up the good performance or if am performing below standard I will work hard to be a better performer* (VHT IDI 31)
Not wanting to let the community down	*The people chose me to do this work. They trust in me and I cannot let them down so by that I keep on with my work as a VHT. There is no profit in terms of money but my profit is seeing them happy*

	(VHT IDI 15)
Meeting new people	*When I go for trainings and meetings I normally meet different VHTs, Doctors and other members with whom I normally share with experiences, challenges and advice on how to continue doing VHT work, this motivates and encourages me to continue working harder* (VHT IDI 14).
Ability to treat or have free drugs for their own children	*I can now comfortably treat my own children without worry since I received training as a VHT* (VHT IDI 3)

VHT retention

VHTs did not generally anticipate leaving their role though did on some occasions suggest that they would leave if they felt they had lost community trust and appreciation. This underscored the emphasis on the importance of community status and standing identified in the previous results section.

> *If there are rumours of people not appreciating my efforts, yet I am volunteering, I better pull out*
>
> (VHT IDI 11)

VHTs did note that events such as moving villages, falling ill or being voted out as the community representative could lead to them leaving as could being offered a paid role.

> *If I get a job where I am paid some money I would leave the VHT work because my family needs to survive and VHT work is voluntary*
>
> *(VHT IDI 9)*

VHT performance

VHTs all wanted more performance based feedback. They typically acknowledged appreciation for what they did receive while stressing that more frequent feedback, and especially feedback specific to their working circumstances and the challenges they faced, would be particularly valued and motivating.

> *I would want them to keep checking on me because it motivates me. For sure, if you are doing work and your 'boss' checks on you and gives you advice you get more encouraged and motivated… what I like most is when they come and find that I have been doing a mistake, they advise me and I stop it*
>
> *(VHT IDI 31)*

There was also a sense that VHT's ability to perform was somewhat undermined by a lack of resources, especially drugs and transport given these affected their ability to treat and reach

patients. These constraints on performance were exacerbated by VHT perceptions of poor responsiveness when they raised their concerns.

> *I think the problems VHTs face are the drugs get out of stock and this interrupts the*
> *service they give*
> *(Male Head of Household IDI 2)*
> *I hate the fact that when our concerns are referred to the higher authorities, they*
> *take long to respond or even never respond, this slows down our work*
> *(VHT IDI 12)*

In general, discussions related to VHT performance centred on the resources available to enable and enhance performance. This included the amount of performance enhancing technical support provided, the need for health-related information and a desire for rapid feedback on submitted data. Such feedback, it was suggested, could come from the health facility-based supervisor or the community as represented by a committee.

> *I think it would be better in case there is a committee of people who can monitor the*
> *performance of these VHTs and also know their challenges and in case of any*
> *problems they can report to these people because as you know, people these days*
> *are not trusted, in case they are given medicine, they can decide to sell it so when*
> *there is a team monitoring these VHTs, they will fear to do so*
> *(Community Leader IDI 5)*

VHTs noted a wide range of challenges in their work, many of which they felt impacted their capacity to perform as VHTs. These challenges are expanded upon in the next section.

VHT work challenges

VHT respondents were keen to discuss the challenges they faced in their work. The issue of a reliable drug supply has been noted above in relation to its impact on VHT performance. This issue was consistently emphasised.

> *Sometimes people go to the health centre to get drugs and they are told that they*
> *are not available, I am forced to go to the health facility to confirm whether it is*
> *true….I also go to the health facility to confirm whether parents have taken their sick*
> *children*
> *(VHT IDI 13)*

Another area of VHT emphasis was the nature of their relationship with community members. Challenges predominantly related to community members not heeding advice and becoming frustrated at being refused treatment, either through lack of drugs or it not being warranted after diagnosis.

> *Dealing with the community can be challenging, sometimes you tell them to do something and they end up not doing it especially health related*
> (VHT IDI 4)

Additional challenges related to; the distance it was necessary to travel to replenish stocks of supplies at the health facility, the means available for this travel, and less frequent supervision than they would like as noted in the 'VHT performance' results section above.

> *Lots of time is spent on covering the long distances between homes…… my age is not good for walking for so long….. If I had a bicycle maybe I would reach more areas*
> (VHT IDI 8)

From the perspective of community members, the main problems facing VHTs as they go about their work relate to transport and the lack of drugs and other equipment required for their job. Transport and movement was a commonly noted challenge for VHTs particularly in the context of communities spread over large distances. People noted that it takes a long time to walk around on foot to visit families and also to go to the health facility to collect drugs.

> *VHTs have many problems but the most pressing one is the long distance that they have to move while carrying out community sensitization. Most of the villages are big and houses are scattered yet they have to go to almost all the homes in the village.* These *people are volunteers who are not given means of transport like a bicycle to do this work. This means that they cannot get enough time to do their other activities so that they earn some money if most of the time is spent moving to different homes and treating children*
> (Male head of household IDI 4)

The impact of drug stock outs was explained in terms of it complicating VHT's work by necessitating costly (both in terms of time and money) travel to collect supplies. It was also noted that there was no guarantee drugs would be available at the health facility upon their arrival. One respondent (caregiver 3) suggested that there was nothing VHTs could do about

this situation. This did not seem to be the prevailing view though with many suggesting that the VHTs were not doing such a good job because they did not have drugs and may even be stealing or hiding them. Several male heads of households identified this as a challenge of community misconception stressing the need for community sensitisation around the challenges VHTs face. They emphasised that it was not as simple as if there were no drugs it meant VHTs were not performing.

> *I think the problems VHTs face are the drugs get out of stock and this interrupts the service they give the community and people usually think she/he may have hidden the drugs*
>
> (Male head of household IDI 2)

> *There seems to be a very big challenge in the communication especially between these VHTs and the health facility where they get their medicines as this hinders their work especially in giving out medicines because at times these VHTs go to the health facility to get medicines without consulting their Supervisors, and at times reach there when there are no drugs in stock*
>
> (Male head of household 5: 27 year old male)

One Local Council Chairperson noted that VHTs 'are not at all motivated by anyone' (Local Council Chairperson IDI 6) meaning that they were not paid and that in the context of the demands placed on them this represented an intolerable burden. This Local Council Chairperson uses the word 'motivation' here as a synonym for payment. Respondents commonly use words such as 'support', 'understanding', 'facilitation', 'consideration' and 'motivation' as euphemisms for some form of payment. Methodologically this presents challenges when trying to understand non-material motivational determinants as well as what sort of non-financial 'support' community members currently or could potentially provide to VHTs.

> *We lack support from above…. they train us without leaving us any facilitation… they make action plans at the trainings although no resources are allocated*
>
> (VHT IDI 8)

Table 3.5 contains the main themes generated from VHT testimony relating to their work challenges.

Table 3.5: The most emphasised work challenges from interviews with VHTs

Theme	Illustrative quote
Difficulties with distance and transport	*When I refer a child to the hospital … in most cases I fail to go back to check on the child because transport is a challenge* *(VHT IDI 9)*
Community members not following advice	*We face a challenge of the people refusing to do as they are told, they challenge us to go and dig toilets for them or stop telling them to do so* *(VHT IDI 8)* *In the end some community members began to feel bad and hate me that I am putting pressure on them* *(VHT IDI 13)*
Resentment from parents at not being provided with drugs	*Parents bring sick children …. when you test them and find they are negative some parents do not believe you….. I try hard to explain but parents don't agree especially when they see their children are having high temperature* *(VHT IDI 7)*
Insufficient allowance/funds	*My problem is transport because I walk a long distance I spend my money and I should be refunded. One time we were invited to the health centre and we were not given our transport refund and I felt so bad* *(VHT IDI 31)*
Lack of drugs	*The problem is drug stock outs …The test kits are finished first because we have to test every child who is brought …. sometimes you come to the health facility and find there are no drugs* *(VHT IDI 7)*
Lack of light for treating children at night	*Sometimes parents bring sick children at night yet I don't have enough light in my house. It is so difficult to tell a parent that go back and come the following morning since sickness knows no time* *(VHT IDI 7)*
Not following referral instructions	*When I give referral forms to the parent of the sick child...they do not want to go to the health centre complaining that it is far from here so instead they go to the nearby private clinics* *(VHT IDI 4)*
Lack of standard equipment (registers, IDs and other identifiers)	*Community members sometimes wonder what kind of people we are because we go and talk to them without anything showing we are VHTs* *(VHT IDI 12)*

Community issues and influence

VHTs identified challenges working with the community as noted in the previous section. They felt that more harmonious relations could potentially be achieved if community members had a greater understanding of the VHT role and appreciation of its value. Two main ways in which this could be achieved were suggested. The first was the value of community members seeing VHTs interact with their supervisors. VHTs felt community

members perceived such interaction as endorsement and validation of their role by health facility based supervisors and therefore the health system.

> *Community trust is increased by seeing our supervisor … local authority interaction*
> *with VHTs would show they are valued*
> *(VHT IDI 13)*

The second was engaging community members in an acceptable forum where different views could be canvassed and understood. Supervisors also recognised the benefits of such a forum for VHTs.

> *I can easily explain to the* (group or committee) *members the challenges I experience*
> *and would also get their own views and ideas and together we can get a way*
> *forward… it creates a level of understanding and togetherness*
> *(VHT IDI 3)*

> *If the VHT sees that the people s/he serves are concerned they will be more*
> *committed and love their work more unlike today when all the time they are*
> *complaining because of lack of this assistance from the community*
> *(Supervisor IDI 1)*

Community and VHT response to proposed community committees was positive. Supervisors also felt that community committees would provide crucial support for VHTs.

> *All the VHTs have problems …by the time they reach us supervisors, it is too late but*
> *if the committee is there …. it will help. The VHTs need back up of this committee to*
> *perform well their work*
> *(Supervisor IDI 5)*

Community committees and groups have reportedly met resistance in the past due to perceived agendas, exclusivity and inaction which have in turn led to apathy towards organised community forums.

> *I normally notice a major problem of people losing trust and hope in these groups*
> *especially when their expectations are not met … they end up demoralised as a result*
> *of no actions*
> (Caregiver IDI 2)

Despite these concerns, it was felt community committees could work if introduced and operated in a certain way. The general view was that community members are likely to

engage and VHTs to feel supported and maintain their efforts if community forums are active and meet expectations. Expectations were that content be locally meaningful and well explained, that meetings not be too time consuming and that activities be purposeful and enjoyable.

> *What is important is the way the explanations are made, the schedule, time of the meeting … People would be able to discuss, make plans and solve VHT problems especially if the meetings take a short time because people do not want to take long in meetings because they complain that they have a lot of other responsibilities*
> *(Supervisor IDI 3)*

> *If people see that the programs are working very well, they will come for the meetings but if the committee is not active, people will only attend the first meetings and as time goes on they will stop attending the meeting*
> *(Community Leader IDI 1)*

Mobile phone issues and influence

All interviewed VHTs used their personal phones for VHT activities and reported being proactive in initiating VHT work related communication. Phones used for VHT work and branded as such were seen as signifying the importance of the VHT role.

> *Even having a VHT marked phone brings you respect from the people in your community*
> (VHT FGD 6)

Airtime was usually self-financed and phone functions were limited to making and receiving calls and sending and receiving messages from other VHTs, supervisors and community members. A range of communication purposes were citing including notification of child illness, drug stock-outs and community mobilisation.

> *I use my phone as a contact where community calls to inform me of sick children. I also use it for mobilisation activities. Others beep me and I call back. Airtime is paid at a personal cost. I use it to call other VHT members informing them of upcoming VHT activities*
> (VHT IDI 2)

> *In case medicine is finished, I can easily call my supervisors to let them know about the situation*

(VHT IDI 4)

Some VHTs anticipated that submitting routine data using their mobile phones would demonstrate to their supervisors that they are useful and doing their job. Feedback from supervisors was generally seen as of value and many VHTs expressed the wish to receive more frequent feedback on their VHT work. One noted that lack of such feedback was de-motivating.

When I submit information, my coordinator and supervisor will know that am not just enjoying the privilege of being a VHT member but am showing that am capable of serving the community
(VHT IDI 5)

I do not receive any feedback and that de- motivates me and feel my concerns are not addressed
(VHT IDI 13)

Despite the advantages VHTs recognised of using mobile phones for VHT activities, some also anticipated potential challenges. These fell into the broad categories of poor network access, lost and stolen phones, challenges with charging and user friendliness and the need for training in use.

I dislike walking a half a kilometre looking for the network to be able to submit the report
(VHT IDI 31)

If not all VHTs are oriented on phone use some may have a problem operating the phone itself
(VHT IDI 12)

When potential mobile phone supported interventions were suggested to VHTs, the importance of timely responses to concerns they raised and maintaining a professional and respectful tone of communication with them was emphasised. VHTs cautioned that if timeliness and tone were not appropriate and communication was not contextually relevant, interventions could result in VHT demotivation.

What is least motivating is that the messages are automatically generated and does not distinguish whether I have done well or not, can't show whether am progressing or not but it is a message sent to whoever submits data

(VHT IDI 1)

Key findings from the formative research relevant to intervention design

Based on the results of the formative research six key findings were drawn on to guide intervention design. These were:

1. VHTs are motivated by their status and standing in the community and the perception that they add value

2. VHTs value technical feedback and supportive encouragement from both supervisors and community members

3. Feeling connected to both the health system and the community they serve motivates and seemingly validates VHTs in their role

4. Adequate resources—especially drugs—must be in place for VHTs to be motivated and perform

5. Participatory activities in the community that are open to all, enjoyable, purposeful and focused on positive local health outcomes delivered through VHTs are likely to sustain community interest and engagement and motivate VHTs

6. Interventions supported by ICT that facilitate easy communication, provide context-specific technical support and engender a sense of connectedness to the health system, supervisors and peers are likely to increase VHT motivation.

3.3.3. Development of interventions to improve VHT work motivation

Based on the key implications for intervention design drawn from the theoretical review and formative research, and following the development process outlined in Table 3.1, the 'community-supported' and 'technology-supported' interventions were refined. Drawing on social cognition approaches and the SIA specifically, as well as the results of the formative research, both interventions were designed to appeal to VHT goals through emphasising status and standing, promoting connectedness to the health system and the community, and providing technical feedback, encouragement and resources. Table 3.6 summarises the key findings from the literature review and formative research and how they informed the intervention design strategy.

Table 3.6: Summary of literature review and formative research findings and the intervention strategy

Key findings:		
Previous CHW strategies	**CHW motivation literature review**	**Formative research**
• Focus on providing incentives • Criticised for insufficiently accounting for contextual influences	CHWs who 'identify' with the collective will be motivated to act in the perceived interests of that collective For actions to be consistent with performance objectives they must be: • perceived as meeting individual and collective CHW needs • considered achievable by CHWs • consistent with the requirements of the CHW programme	CHWs want to: • Have the tools, support and information to do the job • Feel part of the health system and community - Improve local health • Achieve high status and be appreciated by their community
Strategy:		
Promoting *social identity* of CHWs through emphasis on:		
Status of and respect for CHWs in the community and from the health system	The importance of the CHW role and the activities that define it	A sense of connection and accountability to the community and the health system
Intended intervention outcome:		
Improved CHW motivation, retention and performance leading to improved quality of care for children		

Based on the finding from the formative research that purposeful and participatory community activities that are open to all were likely to be motivating, feasible and sustainable for VHTs, the establishment of village health clubs [52] were decided upon as the key activity in the 'community-supported intervention'. Village health clubs were designed to provide community access to technical and local health knowledge through VHT-facilitated meetings where attitudes to child health and the enabling role of the VHT can be positively influenced and realistic expectations promoted. The clubs aim to encourage VHT collaboration with and accountability to fellow community members in the shared enterprise of improved community health through the implementation of an action planning cycle. In doing so, it was proposed that the intervention would increase community appreciation, understanding and respect for VHTs, and VHTs' sense of community connectedness, all identified through the formative research as important to VHTs and their motivation. As a result, VHTs will, it is proposed based on the SIA, more readily identify themselves as a member of a VHT collective.

Important components were also incorporated into the intervention implementation plan to aid acceptability and sustainability based on the formative research results. These were that the intervention be open to all who wanted to participate, allow village members to direct the content of the meetings (that is to be 'village owned') while retaining a focus on the VHT as a local community asset among other village assets and strengths, and be fun and purposeful.

See Table 3.7 for how the main findings from the theoretical review and formative research support the key elements of the community-supported intervention. See Figure 3.2 for a graphic depiction of the key components of the intervention.

Table 3.7: Emphases from the theoretical review and formative research that support the key components of the community-supported intervention

Community-supported intervention		
Intervention	**Way in which intervention will improve VHT motivation**	
	Theory	**Formative research - Uganda**
Village health club (VHC) utilising a participatory learning and action cycle. To be; facilitated by the VHT, open to all, and fun and focused on community health improvement[13] through utilisation of local assets including the VHT	• Reinforcement and validation of VHT role value to VHTs through facilitation of the VHC and receiving community feedback • By directly seeing and receiving feedback on impact of their work VHTs will more readily recognise the value of their work to the community and VHT collective • Working directly with community members as they identify, prioritise and find solutions to local health challenges will reinforce a sense of connectedness between VHTs and their community • By operating in an interactive local forum community expectations around what it is within the VHTs power to deliver can be explained and managed	• VHTs want a greater sense of connectedness to their community. Community groups established to monitor and provide feedback to VHTs may improve motivation and performance by bringing VHTs closer to their community • Being recognised for their positive work is motivating for VHTs and may engender greater community trust and standing / status. By facilitating clubs VHT recognition is likely to increase • VHTs value community feedback • VHCs are likely to generate locally meaningful and sustainable activities while improving community esteem for VHTs by highlighting the positive role they play

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[13] Community health improvement as negotiated within the group setting. This involved dialogue facilitated by the VHT around what the VHT was tasked to do in their health promotion and iCCM role (i.e. tackling malaria, pneumonia and diarrhoea), but also what the community members felt was needed to improve health locally.

Intervention 1: community supported approach

Village health club intervention
(Uganda)

Intervention component 1:

CHW facilitated community meeting with a participatory learning and action cycle where participants:

1
Identify, discuss and rank child-health challenges

2
Discuss and plan solutions with focus on supporting the functioning of CHW services

3
Take planned actions to meet identified challenges

4
Monitor, report and communicate on their progress

Intervention component 2:
Five principles guide club formation and functioning

Open to all	Village owned	CHW focused	A strength based approach	Fun and purposeful

Link to strategy: why it might work?

Status and respect
Improved community understanding of the importance of the CHW role leading to increased respect for CHWs and demand for services

Connectedness & accountability
Increased CHW understanding of community expectations & community understanding of CHW capacity leading to stronger community ties, realistic expectations and local accountability

Figure 3.2: Key components of the community-supported intervention

As part of the second intervention, the 'technology-supported intervention' VHTs were provided with mobile phones and solar chargers as both key tools for VHT work and signifiers of role that are likely to confer status and standing as indicated by the formative research results. Closed user groups were established to link VHTs with their peers and supervisors through either calls or *short message service* (*SMS)* on the provided phones. Within closed user groups a key component was that communication content be self-determined with the aim of promoting opportunities for supportive encouragement as well a sense of connectedness to both the VHT community and the health system. Regular *SMS*-based technical and motivational messages addressed VHTs' identified need for technical feedback and support and represent an opportunity for the promotion of VHTs as key members of a valued and important collective. Electronic data submission and feedback allowed for rapid, context-based feedback on submitted data designed to promote a sense of the relevance of VHT work and validate each VHT's contribution to a health system of which they are a member. In addition, the supplied phones were programmed with software designed to

directly influence role performance such as modified respiratory timers. See Table 3.8 for how the main findings from the theoretical review and formative research support the key elements of the technology-supported intervention. See Figure 3.3 for a graphic depiction of the key components of the intervention.

Table 3.8: Emphases from the theoretical review and formative research that support the key components of the technology-supported intervention

Technology-supported intervention		
Intervention component	**Way in which intervention will improve VHT motivation**	
	Theory	**Formative research**
Closed user groups	Potentially stimulate a feeling of shared experience and collective identity among VHTs. Specifically, by promoting interaction with peers and supervisors, VHTs may: • Gain a greater sense of the correspondence between VHT goals and those the programme • Understand the value of achieving programme goals to the community and VHT collective • Understand and normalise positive, appropriate and distinguishing actions of 'good' VHTs	• Phone as signifier of role – may increase status and standing of VHTs in their community • Increase ease of communication with supervisors and promote a sense of connectedness to health system • Aid prompt VHT reporting of stock outs and other challenges • No need for VHTs to use own phone – cost saving plus potential to earn from solar charger • VHTs already meet informally so formalises an existing structure that is valued
VHT electronic data submission and feedback & targeted supervision	Through targeted feedback delivered by supervisors: • Gain a greater sense of the correspondence between own goals and those of the programme • Understand and normalise positive, appropriate and distinguishing actions of good VHTs • Promote realistic actions of VHTs that are within their power to deliver	• Feeling valued and linked to the health system • Feeling encouraged by positive local gains / improved community health and their role • Strong desire among VHTs for feedback and more supervision – targeted supervision welcome • Concerns about supervisor speed of responsiveness – needs to be sufficiently prompt to avoid VHT discouragement
Monthly motivational *SMS*	• Through contextually appropriate and regular messages: • Promote the correspondence between VHT goals and those of the programme • Promote the shared experience of VHTs	• Positive, encouraging, polite and respectful tone with emphasis on the value VHTs bring to their community • Important to feel valued, supported and linked to the health system • Receiving messages that are locally relevant and address key challenges

• Promote the value of achieving programme goals to the VHT collective • Validate and normalise positive, appropriate and distinguishing actions of 'good' VHTs • Promote realistic actions of VHTs that are within their power to deliver	promote a sense of relevance and importance to the health system • If message resonates with data submitted then it is likely to be perceived as performance related feedback which was considered motivating by VHTs

Intervention 2: technology supported approach

mHealth intervention
(Uganda and Mozambique)

Intervention components

1. Low cost mobile phones, solar chargers & job aids provided to CHWs

2. CHWs submit data using phones & receive performance related feedback

3. Automatic CHW performance alerts sent to supervisor leading to targeted supervision

4. CHWs communicate with peers & supervisors for free

5. Monthly motivational SMS sent to CHWs

Link to strategy: why it might work?

- Signifies connection to health system & affirms role
- Assists CHW to improve community health
- Increases status in the community

- Feeling valued & respected by & connected to health system
- Affirmation of role in improving community health

- Fulfils CHW desire for feedback and promotes accountability
- Emphasises respect for role & connectedness to health system

Facilitate communication: role affirmation, accountability & connectedness

- Affirmation of importance of CHW role & task reminders
- Respect & connectedness

Figure 3.3: Key components of the technology-supported intervention

While the interventions were designed based on a number of theories in addition to the SIA (notably outcome expectancies, goal congruence and an emphasis on self-efficacy from the social cognition theoretical tradition), the SIA is explicitly described here as a new and novel addition to the current theoretical literature relating to CHWs. As a result, both the community and technology supported interventions seek to promote positive VHT social identity. The interventions are also designed to communicate the actions VHTs can take in carrying out their duties that will maintain this positive identity. It is proposed that VHTs will

be more motivated to carry out these duties in intervention areas when compared against a control group.

3.4. Review of the approach taken and next steps

Behavioural theory and the findings from formative research were utilised in the development of two interventions to address the challenge of VHT motivation, retention and performance in Uganda. The findings of the theoretical review led to an emphasis during the intervention design process on the promotion of synergies between VHT goals and those of the VHT programme, the value of achieving those goals and building a sense of collective VHT identity. In addition, it was proposed that if the interventions could convince VHTs that tasks required by the VHT role simultaneously improved the esteem in which VHTs were held, socially identified CHWs would be motivated to adopt these behaviours and performance benefits would follow.

Formative research conducted with CHWs and stakeholders in CHW programmes also strongly influenced intervention design. The formative research findings led to a specific emphasis on generating feedback from the health system and the community as well as cultivating a sense of connectedness with both. Promoting CHW status and standing was also an emphasis. While broadly consistent with the recommendations of other studies of CHW motivation, the formative research revealed that these emphases were the most feasible and acceptable approaches in the context and were thus preferred to alternatives among a suite of strategies proposed elsewhere (Bhattacharyya et al., 2001, Strachan et al., 2012). A limitation of the approach was that VHTs were not sampled based on their sex so gender based analysis was not possible. While both male and female VHT participants were recruited, and there were no major differences in testimony discernible from the analysis based on respondent sex, a more explicit gender focus may have yielded more nuanced insights.

The inSCALE project has evaluated the effectiveness of the interventions on motivation, performance and retention as well as on the social identification of VHTs, with the results due for publication in mid 2019. Chapters 4 and 5 present the results of the development process for the VHT work motivation and social identification measurement scales that were used in the inSCALE endline evaluation. In Chapter 6 the results of qualitative work exploring

the nature of the relationship between VHT work motivation and social identification in the context of the inSCALE interventions is presented.

3.5. Conclusion

It is proposed that drawing on contextual data and theory that is sensitive to context will lead to the development of more appropriate and effective interventions when aiming to improve the motivation, retention and performance of CHWs in Uganda. Evaluation of the interventions developed by the inSCALE project and described in this paper will allow for an assessment of the suitability of the SIA for guiding intervention development for this purpose. In addition, it will inform the assessment of whether taking interventions designed drawing on its key tenets to national scale in Uganda is warranted. Should this prove to be the case, an increased focus on appealing to the needs of socially identified collectives of CHWs may represent a relatively simple, cost-effective and complementary strategy to the traditional approach of tailored incentive packages.

4. Development of a practical, reliable and valid VHT work motivation measurement scale

4.1 Introduction

This chapter presents a work motivation measurement scale designed for use with volunteer village health team (VHT) members in Uganda. This scale was designed to evaluate the impact of the inSCALE interventions on VHT work motivation. Scales designed to measure volunteer CHW work motivation in settings comparable to Uganda were not identified during the literature review (see Chapter 2). As a result, the need to develop a VHT work motivation measurement scale was recognised. Here the measurement scale's design and assessments of validity and reliability are presented. The aim of this chapter is to establish the extent to which the proposed VHT work motivation measurement scale actually measures VHT work motivation in this context.

Work motivation cannot be directly observed in the way that heart rate, blood pressure or income can be. It is therefore a 'latent' rather than 'manifest' variable (Kanfer et al., 2012). Any attempt at measuring it must therefore rely on capturing data from manifest indicators proposed to be associated with work motivation (Kanfer et al., 2012). The degree to which these manifest indicators are actually indicative of work motivation is determined by their 'validity' (Kanfer et al., 2012, Morrison et al., 2015). The likelihood of the indicators producing the same results with the same population at a different time is determined by the amount of error in the measurement, or its 'reliability' (Streiner and Norman, 2008, Morrison et al., 2015).

Presented in this chapter are the steps taken in the development of the VHT work motivation measurement scale with a particular focus on efforts to enhance and assess validity and reliability. After defining work motivation, the validity and reliability considerations necessary when developing a scale to measure a latent construct such as work motivation are explored. Methods, Results and Discussion sections follow, all structured based on the validity and reliability tests undertaken. The chapter concludes with a comment on the potential for the measurement scale to be used to measure VHT work motivation in Uganda (i.e. its practicality) as well as its generalisability to other contexts and health worker groups.

Definitions of important concepts and terms used during the VHT work motivation scale's development are presented in table 4.1. These terms are also used in Chapter 5 where the VHT social identification measurement scale development and validation process is presented.

Table 4.1: Defining important concepts and terms for measurement scale development (from Borghi et al, 2017)

Construct:	Used to refer to motivation and social identification as a theoretical concept
Dimension:	Dimensions refer to sub-categories of motivation and social identification when these constructs are conceptualised as multi-dimensional. For example, internal and environmental motivation may be identified as distinct dimensions of motivation. These dimensions may be proposed from theory or literature or emerge through the research process
Factor:	A factor refers to the unobservable (or latent) dimension in question, which is measured by the items relating to it. For example, the unobservable factor 'individual motivation' may be indicated/measured by observable or recordable items (i.e. that survey respondents provide)
Item or scale item:	Refers to a statement or question in a survey tool
Response scale:	Refers to the response options presented to the respondent in relation to any item - for instance, the multiple, ordered response options available with a Likert scale.
Measurement scale (or 'scale'):	Refers to a set of items intended to measure the same construct (e.g. work motivation or social identification)
Survey:	Refers to the entire questionnaire which usually includes more than one measurement scale and a variety of other items (e.g. demographic, work related)

4.2 Defining work motivation

In Chapter 1, work motivation was defined as 'an individual's willingness to exert and maintain an effort towards organisational goals' (Franco et al., 2002) (P. 1,225). Franco et al (2002) conceptualised work motivation occurring as a function of properties of the individual and the work environment as well as the interaction between them. The implication of this conceptualisation for work motivation scale development has been the inclusion of scale items related to the individual as well as the individual's perceptions of their work environment (e.g. Franco et al, 2004, Penn-Kekana et al, 2005, Chandler et al, 2009).

Franco et al's (2002) influential definition of work motivation was drawn on for the development of the VHT work motivation measurement scale presented in this Chapter. The definition is explained in some detail in section 4.5.1 including a rationale for its use and

exploration of how it has influenced the development of health worker motivation scales in LMICs (e.g. Penn-Kekana et al's, 2005 and Chandler et al's 2009).

4.3 Validity and reliability

When developing a scale to measure a latent construct such as work motivation, the literature supports a focus on establishing scale validity and assessing the reliability of data it produces (American Educational Research et al., 1999, Streiner and Norman, 2008, Chandler et al., 2009, Kanfer et al., 2012, Haslam and McGarty, 2014, Morrison et al., 2015). Establishing scale validity includes clarification of the construct and providing a rationale for the legitimacy of the scale structure and design as well as the wording of scale items. The specific details of how validity and reliability were addressed appear in the Methods section. In this section the concepts of scale validity and reliability are defined.

4.3.1 Validity

The COnsensus-based Standards for the selection of health status Measurement INstruments (COSMIN) checklist steps out key criteria for the assessment of health measurement tools (Mokkink et al., 2010). It proposes that content [1], construct [2] and criterion [3] validity and their sub-elements all contribute to overall validity (Mokkink et al., 2010). As the research focus in this study is on the measurement of a latent construct in a setting where such measures have not previously been applied, an additional focus on establishing whether scale items were understood by respondents as intended by scale designers, or the item's 'cognitive validity' [4] (De Silva et al., 2006), has also been included within considerations of construct validity.

1. 'Content validity' refers to whether a scale includes the most relevant and important aspects of the construct for the target population (Streiner and Norman, 2008, Reeve et al., 2013). It includes 'face validity' or whether the questions posed appear to be a reasonable translation of the construct under investigation (Mokkink et al., 2010, Streiner and Norman, 2008). It is also important, especially when developing a scale aiming to measure a latent construct, to both define the construct and clarify how the proposed scale is designed to capture the construct's sub-components (Kanfer et al., 2012, Postmes et al., 2012). Definition of the latent construct or 'conceptual clarity' (Howell, 2013) is a critical step when seeking to develop the most parsimonious measure

(Haslam and McGarty, 2014). That is, where sufficient but not too many conceptually distinct sub components have been included in the measure to appropriately capture the construct (McGrath, 2005, Howell, 2013). In addition to providing conceptual clarity, definition of the construct being measured is important if an assessment is to be made regarding the appropriateness of the chosen or developed manifest indicators.

2. Assessing 'construct validity', or the degree to which the measurement instrument captures data indicative of the construct under investigation, is also important (Kanfer et al., 2012, Haslam and McGarty, 2014). Assessment of construct validity involves analysis of scores generated by the manifest indicators proposed to be indicative of the latent construct under investigation, namely VHT work motivation.

Cognitive validity', as mentioned above, is also explored. When developing measurement scales to measure latent constructs in culturally and socio-economically diverse settings, confidence that respondents actually interpret questions as meaning what is intended may be misplaced (De Silva et al., 2006). This is especially relevant when the scale is designed by a researcher not from the research setting as is the case for the VHT work motivation measurement scale in this study. Assessing 'cognitive validity' has been proposed as a strategy to avoid potential misinterpretation and assist in the design of culturally and contextually appropriate measures (Bowden et al., 2002, De Silva et al., 2006). It is noted in the literature that this is a consideration that has often been excluded or underemphasised (De Silva et al., 2006). This important aspect of scale construct validity is explored through qualitative approaches in this Chapter.

3. Criterion validity assesses whether the data generated by the scale behaves as it theoretically should (De Silva et al., 2006, Streiner and Norman, 2008). 'Criterion validity' has been used as an umbrella term inclusive of concurrent and predictive (Mokkink et al., 2010), as well as discriminant and convergent validity (De Silva et al., 2006). Concurrent validity indicates the ability of the scale to discern between groups that should produce different scores, predictive validity the ability to predict scores or patterns it theoretically should, discriminant validity the lack of association between scores of different components of the measure, and convergent validity the ability to produce similar scores to a 'gold standard' measurement of the same construct (De Silva et al., 2006, Mokkink et al., 2010, Streiner and Norman, 2008).

It is also important to consider forms of invalidity (Messick, 1995). There are two main considerations regarding invalidity; deficiency [1] and contamination [2] (Kanfer et al., 2012).

1. Deficiency is where the scale fails to capture aspects of the latent construct that it aims to or theoretically should. Conceptual clarification of central concepts is important to offset the risk of deficiency.

2. Contamination is where variance in scores generated by the measure may be systematically influenced by a factor not incorporated in the conceptualisation of the construct (Kanfer et al., 2012). For example, social desirability bias occurs when the need to be viewed positively influences respondents' response choices (Streiner and Norman, 2008). It is an example of contamination and can potentially undermine the validity of a scale (Kanfer et al., 2012, Streiner and Norman, 2008). Designing a scale to capture a latent construct comes with a risk of social desirability bias (Kanfer et al., 2012). Developing scale items that are well defined, carefully worded, relevant to the respondents, and that have been pre-tested and administered by well-trained field workers can offset the risk of this bias to a degree (Streiner and Norman, 2008, Kanfer et al., 2012).

By exploring different types of validity, evidence may be accumulated regarding the likely accuracy or robustness of the data produced by the measure. Validity is not present or absent but rather a consideration subject to the accumulation of such evidence (Kanfer et al., 2012).

4.3.2 Reliability

Typically, reliability tests seek to determine measurement error by assessing internal consistency and reproducibility (Streiner and Norman, 2008, Haslam and McGarty, 2014). Reliability, like construct validity, is subject to assessment through the use of specific measures appropriate to the type of measurement scale developed and the target population (Streiner and Norman, 2008, Kanfer et al., 2012). Internal consistency tests require a single administration of the scale where reproducibility tests require multiple administrations over time with the same population (i.e. test-retest reliability) or across field workers (inter-observer reliability). Tests of internal consistency were the focus of attempts to ensure the reliability of the VHT work motivation measurement scale given that it was administered at one time-point only (i.e. as part of the inSCALE project endline evaluation) and by multiple fieldworkers. Consideration was also given to potential clustering effects from the cluster randomised control design, potential bias introduced by individual data collectors, and the usability and acceptability of the scale for VHT respondents.

The Methods section outlines how each of the different types of validity and reliability was specifically addressed when developing the VHT work motivation measurement scale.

4.4 Methods

The previous section introduced the key elements of validity and reliability that should be addressed when developing a measurement scale. The following section describes the methods used when developing the VHT work motivation measurement scale to increase its validity and reliability. The methods for testing the validity and reliability of scores generated by the draft scale are then described including description of the methods used to adapt or further improve the scale after early testing.

Table 4.2 summarises the specific aims and methods used in the development and testing of the VHT work motivation measurement scale. These are organised into the types of validity addressed which are referred to as scale design components. The Methods, Results and Discussion sections are all structured according to these components.

Table 4.2: Summary of VHT work motivation measurement scale design aims and methods

Scale design component		Aim	Method [NB: Methods conducted pre-survey data collection with VHTs shaded yellow, methods conducted post-data collection shaded green]
Type of validity	Content	1. Conceptual clarity: define VHT work motivation	Literature review: focus on measuring CHW work motivation
		2. Include manifest indicators of the key components that contribute to VHT work motivation	1. Literature review: focus on domains of work motivation 2. Review of domains from literature review against the findings from the inSCALE project's formative research with Ugandan VHTs
		3. Design an appropriately structured and worded measurement scale in terms of language and culture	1. Literature review: lessons from similar settings 2. Formative research: lessons from the research setting
	Construct	1. Assess whether manifest indicators are interpreted as intended and are meaningful to VHTs 2. Determine acceptability of scale format for VHTs	Qualitative 'cognitive' interviews with Ugandan VHTs to understand interpretations of key words, concepts and scale items, and acceptability of the survey structure
		3. Assess the degree to which data captured by the manifest indicators are indicative of VHT work motivation and its sub components	1. Item reduction techniques: eliminate items with poor psychometric performance (i.e. those; missing data, highly correlated with other items, and whose score directionality, assessed through a by sort analysis, was not supported by evidence from the formative research) 2. Assess predicted factor structure: exploratory factor analysis 3. Assessment of internal scale consistency: calculation of Cronbach's alpha 4. Generate VHT work motivation scores in different ways for comparison
	Criterion	1. Predictive validity: scale discerns scoring patterns it should	VHT work motivation scores analysed for relationship with variables considered predictive of performance: correlation coefficients Variables selected based on literature review (see chapter 2) and formative research (see chapter 3)
		2. Concurrent validity: scale discerns between respondents that should produce different scores	Mean VHT work motivation scores analysed for difference in inSCALE intervention areas: independent samples t-tests
		3. Discriminant validity: confirm lack of association between scores of different measure components	Exploratory factor analysis to explore the proposed discrete influence of sub-components of VHT work motivation
Reliability		Assess the degree of measurement error of the VHT work motivation measurement scale	1. Assessment of internal scale consistency: calculation of Cronbach's alpha 2. Check for clustering and fieldworker effects: ANOVA of motivation scores by sub-county and fieldworker

4.4.1 Content validity: drawing on reviewed literature and formative research

To increase the likelihood of including the most valid scale content, decisions regarding the inclusion of domains and the wording of scale items were made based on theoretical literature, previous motivation scales developed for other contexts and formative research with Ugandan VHTs (Streiner and Norman, 2008, Mokkink et al., 2010, Morrison et al., 2015). The following specific methods were employed to generate and check the most appropriate content for inclusion in the measurement scale:

1. Literature review (see Chapter 2)
2. Review of the inSCALE project's formative research conducted with Ugandan VHTs (see Chapter 3)

While the literature review and review of formative research were fully described in Chapters 2 and 3 respectively, each method is briefly explained again below. In addition, expert advice was sought regarding the most appropriate content to include in the measurement scale and the optimum scale format[14,15].

Literature review

The literature was searched to explore possible dimensions of VHT work motivation and to source pre-existing scales for possible adaptation or incorporation. Details of the specific methods used in the literature review have been outlined in Chapter 2. The particular focus of the literature review was on work motivation theory, experiences from applied work motivation strategies and previous attempts at the construction of work motivation measurement scales. The results were used to clarify key concepts and assess the completeness of the first draft of the VHT work motivation measurement scale. This was done by assessing and developing a rationale for items included and excluded in comparison with previous work. In order to at least partially address the risks of deficiency and contamination, the results also informed the definition of key concepts and formed the basis for the development of carefully worded and relevant measurement scale items (Streiner

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[14] Clare Chandler is an Associate Professor in Medical Anthropology at the London School of Hygiene and Tropical Medicine and the lead author of the paper referred to as Chandler et al (2009).
[15] Alex Haslam is a Professor of Social Psychology at the University of Queensland. Professor Haslam has published extensively on work motivation and social identity (Haslam et al., 2000, Haslam, 2004).

and Norman, 2008, Kanfer et al., 2012). The literature review also informed the type of scale items used i.e. Likert scale items (Carifio and Perla, 2007).

Review of inSCALE formative research

A key lesson from the literature search was the importance of tailoring the content of any work motivation measurement scale to the particular motivational determinants of the target population. Clare Chandler emphasised the importance of conducting qualitative research with the respondent group to ensure the domains included in the scale were locally meaningful and that no other, locally meaningful motivational domains had been excluded (Chandler, 2011). Including VHT work motivation domains assessed for relevance to VHTs as well as those suggested by VHT testimony was an approach incorporated as a result. This contributed to the measurement scale's face and content validity. See Chapter 3 for the full methods and results of the formative research exploring VHT motivation.

4.4.2 Construct validity: drawing on cognitive interviews and statistical tests

To maximise the construct validity of the VHT work motivation measurement scale it was important to assess the degree to which the included scale items actually measured VHT work motivation. Two key aspects were thus explored. The first was whether the questions were designed appropriately for the context. This involved examination of whether the scale format was acceptable to VHTs and scale items held the same meaning for VHTs as they did for the measurement scale designers. The second was to assess whether the data captured by the scale items proposed to measure VHT work motivation actually measured this. The following specific methods were employed to address these key aspects:

1. Cognitive interviews with VHTs to assess understanding and acceptability
2. Elimination of scale items that do not contribute to the measurement of VHT work motivation
3. Exploratory factor analysis and measures of internal consistency towards developing the most valid VHT work motivation score

Each method is explained below.

Construct validity 1: Cognitive interviews with VHTs to assess understanding and appropriateness of measurement scale

The 'cognitive interviewing' approach was used to understand whether the wording, concepts and mode of questioning in the measurement scale was coherent, culturally appropriate and understood by VHTs as intended. Specifically, feedback was sought from VHTs regarding the five levels of response afforded by the Likert scale items that were used, the pictures associated with these levels of response, understanding of key concepts, the scale's introductory script and understanding of each scale item. The specific approach to collecting and analysing the data from the cognitive interviews is described here. The sampling, interview topic guide development, training of fieldworkers, data collection and management as well as the development of the key word glossary are also described in this section.

Cognitive interviews

'Cognitive interviewing' is a structured approach to individual or group discussions designed to generate data relating to the construct validity of measurement scale items (Bowden et al., 2002, Campanelli, 1997, De Silva et al., 2006). It describes a qualitative approach to the preparation, collection and analysis of measurement scales. Consistent with previously adopted approaches to cognitive interviewing, and recommendations from comparable settings, a four stage methodology was used (Bowden et al., 2002, Nakigudde et al., 2009, De Silva et al., 2006). The details of each stage were as follows:

1. Establishing the intended meaning of each scale item. The meaning and purpose of each item in the VHT work motivation measurement scale was clarified based on reviewed literature, correspondence with authors of earlier scale versions[16] and formative research conducted with Ugandan VHTs (see chapter 3).
2. Establishing a set of criteria to assess the appropriateness of the measurement scale items and scale structure and format. These criteria, consistent with previous approaches (De Silva et al., 2006), were:
   a. Ensure the target population understands the meaning and interpretation of the items as intended,

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[16] Associate Professor Clare Chandler provided advice regarding the meaning and purpose of the scale items she previously developed and published (Chandler et al., 2009).

b. Ensure item wording is simple, free of jargon, grammatically correct and the level of language is colloquial. If not, establish alternatives,

c. Ensure scale items, structure and format make sense to research assistants implementing the measurement scale and to respondents.

3. Establishing the methods for judging the appropriateness of measurement scale items. Two approaches were adopted:

a. Expanded and targeted interviews where VHT respondents initially answered each item as they would under normal survey conditions and were then requested to provide additional information designed to elicit their perception of key concepts, comprehension and coherence of scale structure and format. Where items or words were not understood, suggestions for alternative wording were invited. This process involved elements of both 'thinking aloud and non-intervening' and 'probing' approaches to cognitive interviewing (Beatty and Willis, 2007).

b. The assessment of people with insight into the working context of Ugandan VHTs was elicited. This involved receiving feedback on measurement scale items from members of the inSCALE technical and in-country team (see Chapter 1 for how the PhD is nested within the inSCALE project) as well as fieldworkers conducting the interviews with VHTs.

4. Reviewing scale items in light of data gathered through the approaches described in 3a and 3b above. Each scale item was assessed and either included in the final VHT work motivation measurement scale without change, excluded, or revised in its wording to either clarify or change the meaning. Items were excluded where it was established that VHT perception of a scale item's meaning differed significantly from the researcher's and neither modification of wording nor alteration of meaning was considered feasible.

Sampling

Interviews utilising the cognitive interviewing methodology were conducted with 24 VHTs from Kiboga, Kiryandongo and Hoima Districts in Western Uganda in February and March 2013. VHTs in these districts were trained in iCCM of childhood diseases (malaria, pneumonia and diarrhoea). VHTs were purposively sampled based on their workload and supervision frequency as the formative research results suggested these both had an influence on VHT motivation (see Chapter 3). VHTs with both high and low levels of workload and supervision were recruited based on data from the inSCALE project baseline survey database in accordance with the 'maximum variation sampling' approach (Sandelowski, 1995). This

approach is consistent with that taken by previous scale developers in similar settings (De Silva et al., 2006). Male and female, and young and old respondents were also recruited in an attempt to capture the greatest range of responses.

Appendix 9.7 presents the district, workload, supervision, sex and age for each VHT respondent (Table 9.2). Table 4.3 contains details of the sampled VHTs by the key selection criteria.

Table 4.3: Actual VHTs recruited for cognitive interviews by key selection criteria

Key selection criteria	District			Topic guide		Total recruited	Total eligible for sampling
	Hoima	Kiboga	Kiryandongo	A	B		
High workload[a]	5	1	3	6	3	9	11
Low workload[b]	9	5	1	6	9	15	19
High supervision[c]	11	4	3	8	10	18	21
Low supervision[d]	3	2	1	4	2	6	9
Male	7	2	2	6	5	11	15
Female	7	4	2	6	7	13	15
'Young'[e] (<40)	10	4	2	9	7	16	21
'Old'[f] (>= 40)	4	2	2	3	5	8	9

[a] Have seen 4 or more children in the past week
[b] Have seen 1 or less children in the past week
[c] Have visited their health facility 3 or more times in the past three months
[d] Have visited their health facility 1 or less times in the past three months
[e] Less than 40 years of age
[f] 40 years of age or older

Cognitive interview 'topic guide'

The topic guide for interviews consisted of the measurement scale items presented in order with an invitation for respondents to explain in their own words what each meant. This was the aspect that explored 'cognitive validation'. Questions were also asked regarding the question structure (i.e. Likert scale questions and response options) and wording as well as the use of the accompanying image as a respondent aid and key concepts. The topic guide was pre-tested with VHTs where it was decided to split the questions in two as its length meant it took too long to complete. The two guides were the same in all aspects except the first contained the first half of the motivation items (topic guide A) and the second the second half of the motivation items (topic guide B). As a result, data were collected for the motivation items from twelve VHT respondents while data regarding the question structure

and wording and the pictures was collected from all twenty four VHT respondents. The topic guides can be found in Appendix 9.8. Table 9.2 also indicates which VHT participants completed each topic guide.

Fieldworker training, pre-testing and the key word 'glossary'

Four fieldworkers fluent in Luo, Luganda, Runyakitara (the three main languages of the Western Region of Uganda) and English were recruited to conduct interviews and transcribe digital recordings. The fieldworkers were trained on the purpose of the study, approach to data collection and management, appropriate establishment and recording of respondent informed consent, and each section of the topic guide. The topic guides were developed in English with key words and phrases translated into Luo, Luganda and Runyakitara by the fieldworkers and the inSCALE Ugandan team, as well as staff from Malaria Consortium. This 'glossary' of key terms was used by fieldworkers fluent in these three languages during the interviews. A pre-test with VHTs was conducted in Kyankwanzi District.

Data collection and analysis

A group debrief was conducted with fieldworkers who interviewed VHTs at the end of each fieldwork day. A final debrief, once all interviews had been conducted, was recorded and the transcript used as data alongside the VHT interview transcripts. This was to check the research team's meanings and interpretations applied to VHT testimony (McAlpine et al., 2002).

Digital recordings of interviews were translated into English and transcribed verbatim by fieldworkers. Interview transcriptions were reviewed and data collated for each scale item, key word, concept and structural issue. The analysis was then carried out in accordance with the 'cognitive interviewing' methodology described above. VHT respondents were recruited and participated in accordance with the principles of informed consent outlined in the inSCALE project's ethical approval (see Chapter 1).

The results of the cognitive interview process are presented in the Results section. The end product of this process was a list of VHT work motivation scale items in a format acceptable to and understood by VHTs. These scale items were incorporated into the inSCALE VHT endline survey. The next, Methods section explains how survey data were collected. It also explains the tests performed on these data leading to identification of the most valid combination of scale items and item weightings for estimating VHT work motivation scores.

Construct validity 2: Elimination of scale items that do not contribute to measuring VHT work motivation based on survey data leading to estimation of VHT work motivation scores

Data collection

Data were collected face-to-face using paper based surveys during the inSCALE project endline survey which took place in April and June 2014 in 39 sub counties in eight Districts of Western Uganda. The draft VHT work motivation measurement scale was nested within the larger inSCALE VHT survey that also had sections dedicated to collecting socio-economic and performance data as well as the VHT social identification measurement scale, the development and validation of which is the subject of Chapter 5.

Five villages were selected at random from each of the 39 sub counties in the study area (total 195 villages). Criteria for inclusion of villages in the sampling frame was that they should have at least one active VHT. All ICCM-trained VHTs in each selected village were included in the sampling frame. In total, 306 VHTs were interviewed. The majority (55%-65% depending on intervention arm) of villages had 2 VHTs, others had only one or only one was found.

Recruitment, profile and training of fieldworkers

Fieldworkers who administered the VHT work motivation measurement scale were recruited based on local language proficiency, academic qualifications (completed secondary school education and written and oral literacy in English), experience and reliability. They were trained in administering the measurement scale including being split into language teams to review the language glossaries of key phrases, terms and words (English to Luganda, Luo and Runyakitara), and update as necessary. The measurement scale was pre-tested along with all the other components included in the inSCALE VHT endline survey. This involved splitting fieldworkers into pairs and conducting interviews (one observing the other) in the morning, and returned to the training facility in the afternoons for discussions and updates to materials as required – these mostly centred around language inaccuracies.

Data management

Quality control checks were carried out by the inSCALE project technical team on a random selection of completed surveys, checking for accuracy and completeness of answers. Supervisors checked all forms. Visits were made to the field by technical staff to accompany and observe field staff conducting interviews. Forms were batched by field teams and double

entered by data entry clerks. Range, consistency and inter-form checks were run on all entered data and corrections made as necessary. Final data cleaning and preparation for analysis was performed by the epidemiology team at the LSHTM (see Chapter 1 for how LSHTM work with the inSCALE project partnership).

All data analysis was conducted in Stata SE 13.

VHT work motivation measurement scale item reduction and 'plausibility' assessment

Item reduction techniques were adopted to detect which of the twenty-four scale items had poor psychometric performance in line with conventionally accepted approaches. This involved:

1. Removing respondents with missing data. Initially it was proposed to remove only those with less than 10% data (Chandler et al., 2009, Borghi et al., 2017). As just eight respondents had missing data, they were deleted from the data set.

2. Removing variables with greater than 80% of responses recorded in the same response category given they offer little discriminatory value (Chandler et al., 2009, Streiner and Norman, 2008, Borghi et al., 2017).

3. Evaluating the internal consistency of the VHT work motivation measurement scale by conducting a polychoric correlation analysis on all variables to calculate inter-item correlation coefficients and eliminate those variables that were closely correlated (Clark and Watson, 1995, Chandler et al., 2009). Calculating polychoric correlation coefficients is the conventional approach taken to estimating correlations between two theoretically continuous and normally distributed latent variables from two observed ordinal variables such as those derived from the Likert scale items used in the VHT work motivation measurement scale (Ekström, 2011). To be considered internally consistent variables should be moderately correlated. That is, variables that are highly correlated add little of value to our understanding of motivation while items that are uncorrelated are likely to be measuring different constructs (Morrison et al., 2015). Variables that were correlated at or greater than 65% were eliminated to reduce item content overlap (Olatunji et al., 2007). The decision of which to exclude was made based on which was more highly correlated with other, retained variables.

A bysort analysis to detect directionality of scoring on each variable against variables whose scoring was considered most predictable from the formative research was conducted. The

purpose was to establish that scores were 'plausible' (Borghi et al., 2017). That is, whether they, in general increased and decreased as predicted depending on the scoring direction both as a reliability measure and to ensure it was appropriate to reverse score those variables that were reverse worded (Morrison et al., 2015).

Establishing the most valid scale item composition for estimating VHT work motivation scores

An exploratory factor analysis was run from the polychoric correlation matrix on the remaining variables to 'identify meaningful dimensions of motivation' (Borghi et al., 2017. P. 7). At the same time, a scree test to generate eigenvalues was run in order to estimate the optimum number of factors. Factors with an eigenvalue of 1 or greater were included with consideration given to including factors with an eigenvalue of less than 1 that nevertheless contributed to the understanding of VHT work motivation (Yong and Pearce, 2013). A second run of the polychoric factor analysis specifying the optimum number of factors was run to cross check the factor loading from the first factor analysis run. Variables that did not load to 0.4 in this factor analysis were removed on the basis that they did not make a substantive contribution to the underlying dimensions of VHT work motivation identified. A factor loading 'threshold' of 0.4 is conventionally used for this purpose (Borghi et al., 2017, Chandler et al., 2009).

Polychoric rotated or promax oblique factor analysis was run on the remaining variables to better specify matches between variables and factors as indicated by their factor loadings while still allowing for factors to be correlated (Fabrigar et al., 1999, Abdi, 2003, Chandler et al., 2009, Baglin, 2014). Loading tables were then examined post rotation for the best fit to the data. This was defined as item loading of above .3 and no or few cross-loadings (Chandler et al., 2009). Cross-loading was considered to have taken place when an item loaded at .32 or greater on two or more factors (Osborne and Costello, 2009, Yong and Pearce, 2013).

Confirmatory factor analysis was not used as work motivation measurement scales had never previously been implemented with this population. This led to less certainty when predicting the underlying dimensions or factors influencing this overarching, latent construct (Borghi et al., 2017).

Measures of internal consistency

Cronbach's alpha tests were run on all remaining variables as well as variables in each factor, to determine internal consistency of the scale. The convention in the literature is that the

items of a measurement scale should together return a Cronbach's alpha score >.7 if the scale is to be considered as having 'acceptable' internal consistency (Bland and Altman, 1997) and the results are to be used for research but >.9 should the results be used clinically (Streiner and Norman, 2008). The conventional acceptability thresholds for measurement scale Cronbach's alpha scores are presented in Table 4.4.

Assessing internal consistency of the proposed measurement scale contributes to an understanding of both validity and reliability. In providing an assessment of the coherence of the combined scale items when seeking to measure the underlying construct of work motivation, it contributes to construct validity. By providing an assessment of measurement error, internal consistency also provides an indication of scale reliability.

Table 4.4: Cronbach's alpha acceptability thresholds

Cronbach's alpha (α)	Internal consistency
α ≤ 0.9	Excellent
0.8 ≤ α < 0.9	Good
0.7 ≤ α < 0.8	Acceptable
0.6 ≤ α < 0.7	Questionable
0.5 ≤ α < 0.6	Poor
α < 0.5	Unacceptable

Source: (Bland and Altman, 1997)

Estimating VHT work motivation scores

Items were reverse coded where necessary so that a higher score indicated greater VHT work motivation. Five different methods were used to estimate a VHT work motivation score before the final method was determined. As the calculation of these scores required data generated from the VHT endline survey and qualitative data, further specific explanation as to their computation is provided in the Results section.

The five scores were compared for variation against variables predicted to influence or not influence VHT work motivation. The purpose of this was to assess which score performed in a manner most consistent with predictions based on theory and formative data (see section on 'criterion validity' below). A critically reasoned decision of the optimum mode of scoring to adopt was taken based on the results of these comparisons.

4.4.3 Criterion validity: testing VHT work motivation scale performance against predictions

Four types of 'criterion validity' are commonly considered; predictive, concurrent, discriminant and convergent validity. This study is able to make an assessment of some but not all of these validity types. It was possible to explore the predictive, concurrent, and discriminant validity of the motivation scores derived from this VHT work motivation measurement scale (De Silva et al., 2006, Streiner and Norman, 2008, Mokkink et al., 2010, Morrison et al., 2015). It was not possible to compare VHT work motivation scores to scores generated by alternative, 'gold standard' work motivation tools with the same population ('convergent validity') as such tools were not found (Streiner and Norman, 2008).

Predictive, concurrent and discriminant validity

The VHT work motivation scores were tested for score variations influenced by variables selected from the literature review (see Chapter 2) and formative research results (see Chapter 3). It was predicted that mean VHT work motivation scores would:

1. Decrease as workload increases and increase as supervision and drug supply increase (predictive validity)

2. Be higher in the two inSCALE intervention areas when compared to mean VHT work motivation scores in the control area (concurrent validity).

3. That 'internal' and 'environmental' motivation have a discrete influence on the overarching, latent construct of VHT work motivation (discriminant validity)

Correlations and variation in mean scores between work motivation scores and key variables were calculated to test the strength and direction of any relationship. This approach is consistent with previous scale development approaches (Leach et al., 2008). Assessments of whether 'internal' and 'environmental' motivation had a discrete influence on VHT work motivation were made utilising exploratory factor analysis (see previous section).

Table 4.5 contains a description of how the variables used were calculated. Exploration of correlations and variations in mean between VHT work motivation scale scores and variables of interest are presented in the Results section. Statistical significance is reported at the 95% confidence interval or above.

Table 4.5: Comparison variables for assessment of VHT work motivation measurement scale criterion validity

Variable	How calculated	Results Table
VHT workload[a]	VHT self-report measure of: 1. total hours spent on VHT work last month broken into quintiles of numbers of hours 2. hours spent on child consultations per month broken into quintiles of numbers of hours	4.14
VHT supervision[a]	VHT self-report measure of hours spent on health facility visits to meet their supervisor and collect drugs broken into quintiles of numbers of hours	
VHT drug supply[b]	Mean cluster average scores for percentage of sick children with fever diarrhoea or pneumonia who: 1. went to a VHT and were referred elsewhere because the VHT had no drugs 2. didn't go to a VHT at any point because of perception that the VHT had no drugs NB: higher score indicates lower drug availability	
inSCALE intervention areas[a]	The intervention arm of the surveyed VHT (control, technology or community arm)	4.15
Randomisation cluster[a]	Sub-counties were used as enumeration areas for randomisation	N/A
Fieldworker who administered the inSCALE endline survey	Each fieldworker was assigned a code in order to enable the tracking of data they collected	

[a] Captured from VHT survey interviews conducted during the inSCALE project endline evaluation by fieldworkers who entered and cross-checked the data
[b] Captured from household survey interviews conducted during the inSCALE project endline evaluation by fieldworkers who entered and cross-checked the data

4.4.4 Reliability: assessing internal scale consistency

The reliability of the data produced by the VHT work motivation measurement scale for measuring the work motivation of VHTs was assessed in two main ways. Firstly the internal consistency, or indication of the degree to which the items comprising the scale together contribute to an understanding of VHT work motivation, was assessed. Secondly an assessment of the influence of the randomisation clusters and the fieldworkers who administered the measurement scale was made. Randomisation cluster and the fieldworker who administered the survey were comparison variables so also appear in Table 4.5. In so doing, recommendations of whether these variables need to be controlled for when using the VHT work motivation measurement scale could be made.

Internal scale consistency

As noted above, calculation of the Cronbach's alpha of the combined VHT work motivation scale items contributes to an understanding of the reliability of the data generated by it when estimating VHT work motivation. This measure of internal scale consistency provides an indication that the combined scale items contribute to the single latent construct of VHT work motivation (Streiner and Norman, 2008). This was the sole statistical test indicative of reliability given the one off nature of the data collection (Streiner and Norman, 2008). For instance, it was not possible to make assessments based on test-retest or inter-rater reliability (Streiner and Norman, 2008).

Clustering and fieldworker effects

VHTs were sampled from inSCALE intervention and non-intervention areas. The allocation of areas for intervention implementation was made based on a cluster randomised control design (Källander et al., 2015a). The enumeration areas were sub-counties. It was therefore important to make an assessment of whether the differences in VHT work motivation scores were influenced more by sub-county, and therefore localised factors, than individual differences between VHTs. In order to understand how much variation in the scores was due to variation between clusters relative to how much was due to variation between VHTs, an intraclass correlation coefficient was generated using analysis of variance (ANOVA) (Streiner and Norman, 2008, Kul et al., 2014). Variations in mean VHT work motivation were examined in the same way for the influence of the fieldworker who collected the data.

4.5 Results

4.5.1 Content validity: initial development of the VHT work motivation measurement scale based on theory, previous practice and formative research

This first results section concerns the rationale for the initial development of the content of the VHT work motivation measurement scale. The aim was to include the most valid content (Mokkink et al., 2010, Streiner and Norman, 2008). In the first part of this section the rationale for the selection and, in some instances, development of the VHT work motivation measurement scale domains and scale items is presented. The second part of the section discusses the format of the Likert scale response options that appear in the measurement scales and the images used to help respondents distinguish between these options.

VHT work motivation measurement scale content selection and development

Background to the development of the Ugandan VHT work motivation measurement scale

The development of the VHT work motivation measurement scale drew on previously published scales that focused on paid health workers in low and upper middle income settings (Franco et al., 2004, Penn-Kekana et al., 2005, Chandler et al., 2009). This was because no measurement scale for measuring volunteer, CHW motivation in low income settings was identified in the literature review (see Chapter 2). These scales all work from the definition of work motivation presented in section 4.2. Since the literature review was conducted, and the VHT work motivation measurement scale developed, several other health worker and CHW work motivation scales have been published (Mutale et al., 2013, Brunie et al., 2014, Hotchkiss et al., 2015, Morrison et al., 2015). Experiences from these other studies have been drawn on in the final section of this chapter where the results of the measurement scale development process are discussed.

In the literature review both work motivation theory and experiences from applied work motivation strategies were reviewed. Common to both is an emphasis on the need to understand individual worker differences as well as contextual influences when seeking to motivate workers. The literature relating to measuring health worker motivation in low and upper middle income settings is consistent with this multi-dimensional emphasis and several measures of health worker motivation have been developed (Kanfer, 1999, Franco et al., 2004, Penn-Kekana et al., 2005, Chandler et al., 2009, Mbindyo et al., 2009). The development of the VHT work motivation measurement scale drew on the accumulated experience of this earlier work. Importantly, this included the recommendation of tailoring the content of any work motivation measurement scale to the particular motivational determinants of the target population. As a result, the key focus of the scale design process became to adapt, and where necessary make additions to, this previous work in a way that was meaningful for VHTs in Uganda.

A number of constructs that contribute to and are indicative of health worker motivation in low income settings were proposed in a study of motivational determinants and outcomes by Lynne Franco and colleagues (Franco et al., 2004). These constructs, discussed in Chapter 2, were termed 'domains' and used by Penn-Kekana and colleagues (2005), to develop a multi-dimensional scale to measure nurse motivation in South Africa (Penn-Kekana et al.,

2005). In total Penn-Kekana et al (2005) developed 52 items in twenty motivational domains. Chandler et al (2009) drew on Franco et al (2004) and Penn-Kekana et al's (2005) work to develop the first 'validated instrument for measuring health worker motivation in low-income countries' (Chandler et al., 2009) (p. 2079). This validated scale initially included most of Penn-Kekana et al's (2005) items, as well as several developed from qualitative work with Tanzanian health workers for a total of sixty two items. Items were reduced through an exclusion process[17], and found through factor analysis to load onto two factors termed 'internal' and 'environmental' motivation (Chandler et al., 2009). Chandler et al's (2009) final measurement scale consists of twenty three items in seventeen sub-domains with two overarching domains termed internal and environmental motivation. This structure informed the proposed contribution of the included VHT work motivation measurement scale items to VHT work motivation.

Distinguishing between individual and environmentally influenced motivational determinants

Chandler et al's (Chandler et al., 2009) measurement scale was used as a starting point for developing the VHT work motivation measurement scale in Uganda. This was because it was reportedly validated[18], was more feasible than Penn-Kekana et al's (2005) in terms of length for inclusion in the VHT endline measurement scale[19], and was based on principles of motivation theory consistent with those identified in the literature review (see Chapter 2). This was especially so with regard to Chandler et al's (2009) distinction between motivational determinants operating within the individual and those influenced by the working environment. This distinction between individual and environmentally influenced motivational determinants was adopted when developing the VHT work motivation measurement scale for four reasons.

1. The work motivation literature, as noted above and discussed in Chapter 2, suggests individual worker differences as well as the interaction between the worker and their working environment or 'organisational context' (Franco et al., 2002) influences work

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[17] The same item exclusion process was adopted in this study and is described in the Methods section.

[18] Chandler et al (2009) argued their measurement scale had content validity as it was translated and back translated into the language of respondents, had been piloted with respondents to test for wording 'ambiguities', and included items developed based on the results of qualitative analysis of respondent feedback.

[19] The two measurement scales were required by the inSCALE project to be as brief as possible. This constraint is discussed in the limitations section in Chapter 7.

motivation. Including both elements in a work motivation measurement scale therefore makes theoretical sense.

2. Making the distinction between internal and environmental determinants of motivation in the VHT work motivation measurement scale will enable results to be interpreted in a useful way for future policy and programme design. For instance, should scores on the VHT work motivation measurement scale items indicate that items load onto two factors of internal and environmental motivation as was the case in Chandler et al's study (2009), determining which of internal or environmental motivation is more influential will allow for a more targeted policy or programmatic response. Depending on results, recruiting personnel of a certain type or manipulating working conditions may become the key recommendation (Franco et al., 2004).

3. By identifying the relative influence of individual and environmental determinants of motivation the results of the study may be more easily replicated. In so doing a case may be built for the distinction between individual and environmental work motivation determinants being applicable across diverse contexts (Chandler et al., 2009). Such an outcome would lend weight to the argument of structuring measurement scales to measure work motivation in low income settings in such a manner.

4. Including individual and environmental motivational determinants in the VHT work motivation measurement scale means that data relating to two key aspects of work motivation (as discussed above and in Chapter 2) contribute to the final, VHT work motivation score. That is, while internal and environmental factors can be analysed as standalone constructs in the manner of Chandler et al (Chandler et al., 2009), and allow for different interpretations relating to scores on these two factors as explained in point 2 above, it is proposed that in combination they may provide a more complete indication of VHT work motivation. In so doing the content validity of the measure will be increased as more facets of the construct are being captured (Morrison et al., 2015).

Composition of the VHT work motivation measurement scale – selecting and developing motivational domains

When developing the VHT work motivation measurement scale, the domains created by Penn-Kekana et al (2005) and Chandler et al (2009) were reviewed for relevance to Ugandan VHT working conditions (Penn-Kekana et al., 2005, Chandler et al., 2009). Many domains were not appropriate for inclusion simply because they related to paid health workers when

Ugandan VHTs are unpaid volunteers[20]. The rationale for the inclusion and exclusion of other domains was less obvious. Decisions were made based on the findings of the literature review (Chapter 2), which identified theoretical determinants of motivation, and the formative research with VHTs (Chapter 3), which identified VHT specific motivational determinants. In some instances the formative research results suggested the inclusion of previously used scale items while in other cases they suggested the creation of new ones. An example of the former was where VHTs reported being motivated by validation of their role through feedback from supervisors (inSCALE, 2011b). An example of the latter was where formative research results highlighted that VHTs are motivated by community respect for them and their role (Strachan et al., 2015).

Table 4.6 contains a rationale for why domains used by Chandler et al (2009) and originally developed by Penn-Kekana et al (2005) were included in the VHT work motivation measurement scale based on previous theoretical and empirical work as well as the results of formative research with VHTs (Chapter 3). Whether each domain is proposed to be indicative of internal or environmental motivation is also indicated and referred to as a 'factor' as these proposed latent influences on motivation will be explored through factor analysis. Table 4.7 contains a rationale for why domains previously utilised by Chandler et al (2009) and Penn-Kekana et al (2005) were excluded from the VHT work motivation measurement scale. Decisions were based on an assessment of their applicability to the work setting of Ugandan VHTs.

Table 4.6: Rationale for inclusion of motivation domains

Domains included	Factor	Origin of domain	Rationale for inclusion (Page numbers for where a greater explanation for the rationale are provided)
Job satisfaction	Internal	1	If work is considered to be satisfying it is more likely to be motivating. It may also lead to higher levels of worker retention (Chapter 2 p. 32)
Needs satisfaction		2	If work leads to the satisfaction of worker's perceptions of their needs it is likely to be motivating (Chapter 2 pp. 32&34)
Goal congruence		2	If worker goals are aligned with employer goals then they are more likely to be motivated (Chapter 2 pp. 29&48)

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[20] Payment potentially introduces a different form of symbolic recognition and incentive for work effort (see the section on financial incentives in the literature review in Chapter 2) and thus necessitates a slightly different yet important methodological focus when seeking to measure motivation.

Desire to help others / altruism		2&3	VHTs reported being motivated by serving the public and helping others (Chapter 3 p. 56). This is supported in the CHW motivation literature (Chapter 2 p. 37)
Knowledge gain		2&3	VHTs reported being motivated by the gaining of 'wisdom and knowledge' (Chapter 3 p. 57). This is supported in the CHW motivation literature (Chapter 2 p. 38)
Self-efficacy		1	If a worker believes they can achieve a work objective it can be motivating (Chapter 2 pp. 29&38)
Outcome expectancy		2	If a worker believes that a valued outcome will follow if they carry out the responsibilities of their role it can be motivating (Chapter 2 p. 29)
Motivation		1	How a worker feels about their own motivation and whether they link it to rewards or outcomes they associate with their work can be motivating (Chapter 2 p. 29)
Programme commitment		1	How committed a worker is to their employer can be indicative of their motivation (Chapter 2 p. 38)
Intention to leave		1	Whether a worker has plans to leave their role is indicative of the way they feel about their work and their motivation (Chapter 2 p. 34)
Workload		1	Perception of the achievability of work related tasks and is linked to motivation and influenced heavily by perception of workload (Chapter 2 p. 38)
Organisational citizenship		1	If a worker believes in the value of the organisation or programme they work for and they readily associate with it then it can be motivating (Chapter 2 p. 38)
Resource availability	Environmental	1	If workers don't have the tools for the job they are likely to be dissatisfied and demotivated (Chapter 2 pp. 37&38)
Management and supervision support		1	Worker perception of whether they receive the appropriate amount of support in their role can be indicative of their motivation (Chapter 2 p. 37, Chapter 3 p. 55)
Job security		1	Uncertainty over the continuation of their role may adversely influence worker motivation (Chapter 2 p. 34)
Organisational justice		1	Sense of fairness and reward for effort being recognised by the organisation / programme can be an indicator of worker motivation (Chapter 2 p. 31)
Respect, community appreciation and recognition		2&3	VHTs reported being motivated by the respect and appreciation of their community and being recognised for their work (Chapter 3 p. 56). This is supported in the CHW motivation literature (Chapter 2 p. 37)

Key: 1=from scale developed by Chandler et al (2009) who drew on Penn-Kekana et al (2005) ,
2=developed based on motivation theory identified during the literature review (Chapter 2),
3=developed based on the results of formative research with Ugandan VHTs (Chapter 4)

Table 4.7: Rationale for exclusion of motivation domains

Domains excluded	Factor	Origin of domain	Rationale for exclusion

Attitudes to patients	Internal	1	The wording of items included reference to 'hospitals' and 'nurses' and did not therefore fit with the community setting of VHT work
Attitudes to HIV		2	Not appropriate in terms of subject matter for the VHT work motivation measurement scale (i.e. HIV is not a target disease)
Burnout		1	The wording of Penn-Kekana et al (2005) and Chandler et al's (2009) 'burnout' items implied a level of time bound work commitments that did not resonate with the VHTs voluntary role
Work ethic / job involvement		1	Previous item wording was very similar to those under the included job satisfaction domain and with the emphasis on brevity the domain was excluded
Vocation / job choice		1	Given that previous versions of the items for this domain have focused on the aspiration to be a certain type of paid worker, it was not considered to be a fit for a voluntary VHT measurement scale
Attitude to change		1	No changes to VHT tasks, health system expectations or working environment were anticipated during the project
Extrinsic job characteristics	Environmental	2	Previously items in this domain have focussed on salary based rewards and incentives for performing the work role which are not appropriate to VHT work. The degree to which the benefits (financial, in kind, symbolic or otherwise) of the role meet worker needs was already captured in the 'needs satisfaction domain'
Stress / work hazards / risks from patients		1	Data from interviews with VHTs (formative research) did not indicate this was an important influencing factor on their motivation
HIV / AIDS hazards		2	Not appropriate in terms of subject matter for the VHT work motivation measurement scale (i.e. HIV is not a target disease)
Policy environment		1	Formative research results indicated that VHTs did not tend to reflect on the policy context when it came to their motivation
Salary		3	Not appropriate in terms of subject matter for the VHT work motivation measurement scale given the voluntary nature of the VHT role
Locus of control		1	This domain was considered to be conceptually similar to self-efficacy and indeed they were grouped together by Penn-Kekana et al (2005). Concluded that the domain was adequately covered by the self-efficacy items and with the emphasis on brevity the domain was excluded

Key: 1=from scale developed by Chandler et al (2009) and also appearing in scale developed by Penn-Kekana et al (2005), 2 = from scale developed by Penn-Kekana et al (2005), 3 = from scale developed by Chandler et al (2009).

Once the domains were identified, the specific wording of scale items included within each

domain and in the first draft of the VHT work motivation measurement scale came from four

sources. These were Chandler et al's (2009) scale, correspondence with Clare Chandler (Chandler, 2011) and Alex Haslam (Haslam, 2011), the literature review (see Chapter 2) and drawn from direct quotes from VHTs gathered during the inSCALE project's formative research (inSCALE, 2011b, inSCALE, 2011a) (see Chapter 3).

The first draft of the VHT work motivation measurement scale contained twenty five scale items in seventeen proposed domains of motivation. Of these domains eleven owe their origins to the previous work of Chandler et al (Chandler et al., 2009) which was influenced heavily by Franco et al (Franco et al., 2004, Franco et al., 2002) and Penn-Kekana et al (Penn-Kekana et al., 2005). Six originated from the reviewed theoretical literature on work motivation (Chapter 2), with three of these domains also supported by formative research with VHTs (Chapter 3). One additional domain was created in response to the results of formative research with VHTs (Chapter 3). This first draft of the VHT work motivation measurement scale was developed through the content validity stage of scale development. The construct validity stage followed.

Table 4.8 contains the full wording of the 25 items of the first draft of the VHT work motivation measurement scale.

Table 4.8: First draft wording of the motivation measurement scale items and domains

No.	Domain	Source of item wording	First draft wording
1	Job satisfaction	1	Overall, I am satisfied with my role as a VHT
2		2	I think the work I am asked to do is worthwhile
3	Needs satisfaction	3	The work I do as a VHT provides me with what I need
4		3	It is important that I do a good job as a VHT so that the VHT programme works well
5	Community respect	4	I am respected in my community for the work I do as a VHT
6	Motivation	1	I feel motivated to work as hard as I can
7		1	I only do this job for the benefits that come with it
8		2	I feel motivated to perform the tasks required of me as a VHT
9	Programme commitment	1	I am proud to be working as a VHT.
10		1	I feel committed to my VHT role
11	Goal congruence	3	The VHT programme wants to achieve similar things like I want to
12	Intention to leave	1	I intend to stop working as a VHT
13	Job security	1	I expect to stay working as a VHT in the future

14	Workload	1	I can complete all of the work I am expected to do
15	Organisational citizenship	2	I am willing to do more than is asked of me as a VHT
16		2	Sometimes what I am asked to do as a VHT doesn't make sense but I do it anyway
17	Organisational justice	1	The VHTs who are best at their job are the ones who get the most benefits
18	Resource availability	1	This VHT programme provides everything I need to do my job effectively
19	Supervision	1	Suggestions made by VHTs on how to improve their work are usually ignored by supervisors.
20		2	The supervision of my work is good
21	Outcome expectancy	3	If I do well as a VHT I will achieve my dreams
22	Self-efficacy	2	It is easy for me to keep going to get what I want
23		2	I can solve most problems I face as a VHT if I invest the necessary effort
24	Knowledge gain	5	I gain knowledge from being a VHT*
25	Desire to help others / altruism	5	My work is important because I help people*

* Items not included in the qualitative cognitive validation exercise as they came from VHT interview data collected during the inSCALE project's formative research

Key: 1=from Chandler et al (2009), 2= from motivation scales shared by Alex Haslam (2011), 3= from the literature review (see Chapter 2), 4= from the literature review and inSCALE project formative research (see Chapter 3), 5= from inSCALE project formative research results

VHT work motivation measurement scale format and key concepts

This section presents a rationale for the use of Likert scale items in the VHT work motivation measurement scale based on reviewed literature. Likert scale items were the most commonly utilised mode of question in the reviewed motivation scales, most commonly with five response options (Franco et al., 2004, Chandler et al., 2009). In addition Nakigudde et al (2009) advise adoption of five point Likert scale items in Uganda when working with illiterate or low literacy participants (Nakigudde et al., 2009). VHTs, who often have just a few years of primary school education, have basic or low levels of literacy (Strachan et al., 2015). Likert scale items with five response options were used for the VHT work motivation measurement scale.

With the option to either agree or disagree with Likert scale statements there is a risk that respondents will repeatedly answer in the positive or negative (Streiner and Norman, 2008, Qasem and Gul, 2014). In order to reduce the risk of this type of bias both positively and negatively worded items were included (Streiner and Norman, 2008). In order to reinforce the distinctiveness between categories of Likert scale item response for respondents,

Nakigudde et al's (2009) visual prompts of facial expressions for the different categories were used. These images are displayed in Figure 4.1 below and were reviewed based on data generated from interviews with VHTs as described below.

| Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
| 1 | 2 | 3 | 4 | 5 |
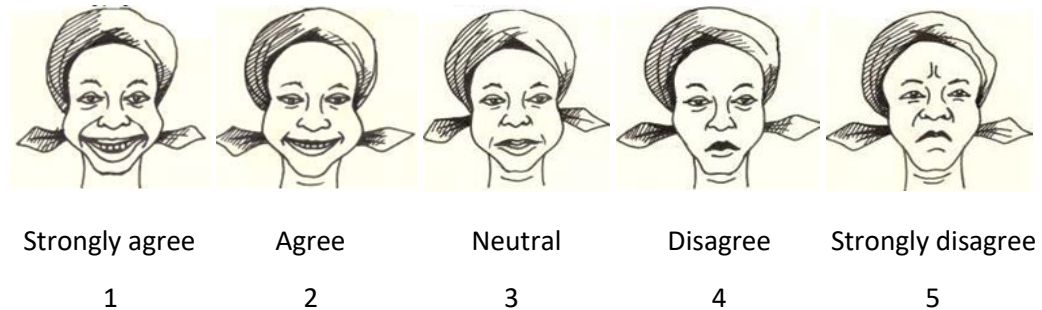
Figure 4.1: Images associated with the five Likert scale categories of response
Source: (Nakigudde et al., 2009)

4.5.2 Construct validity 1: assessing the appropriateness and acceptability of scale format and retaining, editing or excluding items based on VHT respondent understanding

In this section the results of the analysis of cognitive interviews with VHTs are presented. These data were used to assess the appropriateness of the format of the VHT work motivation measurement scale and whether VHTs understood scale items as intended. This contributes to assessments of the measurement scale's construct validity.

Appropriateness and acceptability of measurement scale format

Likert scale item structure
While the bulk of respondents indicated that the response options were clear, fieldworkers felt that the tone or even volume with which a respondent answered was critical in understanding which response category to record.

> *FW5 female[21]: 'Usually it is the intonation or the facial expression which shows the extent to which I am dissatisfied. I might speak a little bit soft and say no but I say no loudly, I mean it is the way I say no that shows you the extent to which I am dissatisfied' [P. 3]*

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[21] FW5 female indicates that the quote is from fieldworker number 5 who is female in the fieldworker debrief discussion.

There was also a sense among fieldworkers that respondents may be reluctant to strongly disagree as it may be felt to be impolite.

> *FW2 female: 'Culturally you don't have to show someone that you strongly disagree and even if someone is strongly disagreeing they will say am neutral (Ndi awo).' [P. 9]*

Very few respondents had difficulty understanding and using the five response categories when responding to the Likert scale items. It was noted that one respondent tended to respond in terms of negative or positive – i.e. indicating that they either agreed or disagreed - rather than using the full five point scale. This respondent needed to be repeatedly reminded to consider all five response options.

> *I22 female[22]: 'I had to keep reminding the respondent where her disagreement or agreement fell in the five options' [P. 6]*

For another respondent it was only possible to respond 'neutral' as they could not be sure how they would feel later in the day were it to, for instance, rain.

> *I16 female: 'I choose option 3, which is neutral because I cannot be sure whether it will rain, you may think it is going to shine only then it rains so you cannot be sure' [p.1]*

Several key emphases were added when training fieldworkers in the implementation of the VHT work motivation measurement scale in order to address these challenges. These were to:

1. Advise respondents that there are no right or wrong answers.
2. Advise respondents to choose an option from the five instead of interpreting tone of voice or the volume of response.
3. Provide clear instructions regarding the importance of respondents choosing one of the five response options that best reflects their current thoughts.

A final recommendation from the fieldworkers was to alter the wording of the 'neutral' response option. It was recommended that the wording be changed from 'neutral' to 'neutral (neither agree nor disagree)' to aid accuracy of comprehension.

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[22] I22 female indicates that the quote is from VHT interview number 22 and the respondent is female.

Effectiveness of images as a response aid

All but one respondent indicated that the pictures accompanying each response category aided their understanding and decision making when determining their response. While several respondents explained the pictures in terms of the level of happiness they conveyed, they still seemingly worked for them as a visual cue for the response categories.

> *I3 female: this one this picture (respondent pointing at option 5), is indicating somebody who is disagreeing. Is even annoyed according to the way I see things here, then this one option 4, the person disagrees though not very much, then this one (Referring to option 3), the picture portrays of a person who is yet to decide, then option 2 accepts but option 1 really shows that the person is in total acceptance' [p. 2]*

The one respondent who objected to the pictures seemed slightly affronted by them.

> *I18 male: 'They are just pictures, they would not help me in giving answers to the statements … my responses don't have to follow those pictures…' [p. 1]*

It seemed to the interviewer that this respondent found the images childish and that if they had used them to assist their thinking it would in some way demean them or indicate a lesser intelligence.

> *FW2 female: 'I think he never wanted to show me that he is using the pictures as if he is a child who is illiterate and has never gone to school, can't express himself in English. That is the attitude I had (detected) the way he was behaving' [P. 3]*

For this respondent the fieldworker indicated the response categories (i.e. written descriptions) were still of use – just without the aid of the images / pictures. Empowering fieldworkers to use the images as a non-compulsory aid for respondents was the strategy adopted as a result. This was emphasised during fieldworker training.

The potential of measurement scale items to offend VHT respondents

The majority of respondents indicated that they had few problems understanding scale items and that few if any would cause offense. One respondent indicated that discussing 'benefits' may be problematic for some as they had not been provided with what had been promised.

> *I6 female: 'We were twenty four people who were trained as VHTs in this parish but you find four or six people who are benefiting from refresher trainings that also annoys me' [P. 9]*

The issue here was not one of misinterpretation *per se* but rather that the content or meaning may antagonise the respondent. As there was little general indication that the items would cause offence, the risk of minor antagonism or annoyance was considered unlikely to distort the validity of responses and therefore no questions were altered on this basis.

Issues of language and translation

VHT cognitive interview respondents were asked which language they were most comfortable using. The results are displayed in the pie chart below (Figure 4.2) with English, Runyoro, Luganda and Luo and combinations of these languages used by 96% of respondents (N=24). These results are consistent with those from the inSCALE baseline survey (see Chapter 1) and the views of the field staff working on the data collection at that time.

Fieldworkers were also invited to provide their opinion during daily debrief sessions and again, once all interviews had been conducted (see Methods section). Fieldworkers suggested that the scale items would be clearly understood by respondents if delivered in the language the respondent was most comfortable communicating in.

> *I19 female: 'They will manage depending on the way how you explain it to them and the language you will have used to ask them. You see like you asked me can you manage English and I told you I cannot, so if you forced me to speak in English I would have not managed. So as long as you ask them in the language they understand they will respond to them' [P. 6]*

The results indicate that a glossary of key terms translated from English into Runyoro, Luganda and Luo should be sufficient in order to provide adequate translations for respondents. The key word approach was adopted instead of full survey translation due to local Ugandan languages being commonly better understood in oral rather than written form (Jönsson and Olsson, 2008). Indeed, in its written form, English was considered to be better understood by fieldworkers than the local languages.
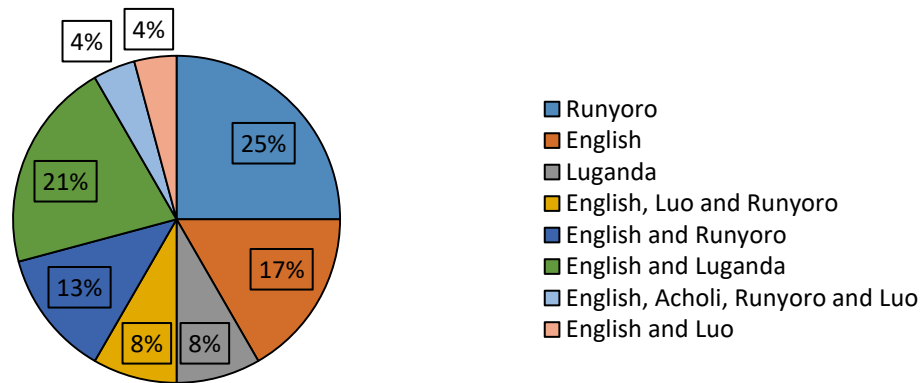
Figure 4.2: Language VHTs most comfortable using

Retaining, editing or excluding items based on VHT respondent understanding

Of the twenty three motivation measurement scale items (see items 1-23 Table 4.8[23]) whose meaning was explored through cognitive interviews with VHTs, seven were altered (items 1, 2, 6, 8, 14, 16 and 23) and one was excluded (item 22). The results from the cognitive interviews for each of these items are presented in Table 4.9 including a rationale for their alteration or exclusion. Often the rationale for alteration drew on the recommendations of the fieldworkers who were trained to implement the cognitive interview methodology. The remaining fifteen motivation items were retained unaltered. This was because VHT respondents understood the wording as intended or sufficiently to render alteration unnecessary. These items are not discussed further in this section and were retained in the version of the VHT work motivation measurement scale implemented within the inSCALE endline survey.

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[23] NB: Scale items 24 and 25 from Table 4.8 were not included in the cognitive interviews because they were developed from VHT testimony collected during the formative research (see Chapter 3).

Table 4.9: Cognitive interview results for altered and excluded VHT work motivation measurement scale items and new item wording

Item wording prior to cognitive interviews (Item no.)	Results from cognitive interviews with VHTs and rationale for item alteration or exclusion	Item wording post cognitive interviews
Overall, I am satisfied with my role as a VHT (Item 1)	The majority of respondents understood this statement as intended. *I24 male: 'Satisfied I think means that I have got what I expected from being a VHT and I have done my role as a VHT successfully' [P.3]* While there was some minor confusion with regard to the use of 'satisfied' it did not seemingly alter the perception of the item meaning sufficiently to warrant alteration. *I13 male: 'in all I have agreed to work as a VHT and that is how I understand it' [P.3]* The word 'overall' was problematic for some VHTs. *I20 female: 'my concern is the word 'overall', some people use it in different ways and it had different meanings especially among the Baganda,* (tribe) *others confuse it with generally meaning let me 'just' '[P.2]* 'In general' was nominated as a viable and preferable alternative by the fieldworkers.	In general, I am satisfied with my role as a VHT
I think the work I am asked to do is worthwhile (2)	While the item statement was generally well understood, the word 'worthwhile' presented challenges for some VHTs. Suggestions were made that referenced why the work was worthwhile. For instance, that it was: *I1 female: 'of benefit to the community' [P.3]* Incorporating an indication of why the work may be worthwhile was therefore considered important to include in the item wording. Definitions of 'worthwhile' commonly indicate that it is worth the time spent. This was incorporated into the item wording. In general VHTs seemed to better understand the intended meaning of scale items when more words were used as opposed to when wording was concise as is conventionally the aim in scale item design.	I think the work I am asked to do is worth the time I spend on it

At the moment I feel motivated to work as hard as I can (6)	VHTs commonly understood 'motivation' to indicate some form of financial payment. *I15 male: 'That* means *I need to be paid or given a reward to work as hard as I can … they told us that the work we were doing is voluntary, we work for free so I have to work for my village to benefit so I cannot wait for motivation' [P.4]* It was necessary to find an alternative word to 'motivation' as it clearly implies or even just simply means payment to a significant proportion of respondents. Feeling 'like' doing something accesses a respondent's inclination to take the action. This was the wording adopted on the recommendation of the fieldworkers. The temporality indicated in the item wording of 'at the moment' was well understood by VHTs. *I16 female: 'the exact time…now or period. For example for us now, at the moment, we have got a problem of water' [P.4]*	At the moment I don't feel like working as hard as I can
I feel motivated to perform the tasks required of me as a VHT (8)	As with item 6, the use of the word 'motivation' was commonly misunderstood as indicating payment. *I16 female: 'That one means they may be given something like money' [P.5]* The use of 'feel like' was adopted as a fieldworker suggested solution as it was for item 6. For one VHT 'tasks' related to the supplies they were provided with to do their work. *I12 male: 'It means materials which are given to me as a VHT' [P.6]* An alternative to 'tasks' proposed by the fieldworkers was 'duties.	I feel like performing the duties required of me as a VHT
I can't complete all of the work I am expected to do (14)	Many VHTs had trouble with the 'can't complete' element of the statement. VHT responses often implied some anxiety that there may be a perception they were unwilling to work. Some respondents were keen to emphasise that such an unwillingness to complete the work was a trait of other VHTs but not them. *I19 female: 'It is like this person is about to stop working because what he/ she is doing is not what is expected from him or her and that shows that such a person does not love what they are doing. Such a person hopes to leave doing that work and may say after all I am just a volunteer. I will stop' [P.2]* While re-wording the item was considered, simply changing from negative phrasing to positive was ultimately considered simpler and more in keeping with the original intention of the item. That is, changing 'I can't' to 'I can'.	I can complete all of the work I am expected to do

Sometimes what I am asked to do as a VHT doesn't make sense but I do it anyway (16)	The key challenge with this item was the 'doesn't make sense' wording. Something not 'making sense' was commonly misinterpreted as being 'useless' [I11].	Sometimes I don't understand why I am asked to do certain things as a VHT but I do them anyway
	I11 female: 'It means that whatever the person does as a VHT is useless for example for me as a VHT, I have been told to go and treat a child but the child has failed to get better, therefore It means I am just working for the sake of it, because I have not accomplished my role' [P.3]	
	Despite these challenges, the statement was also understood as intended by several respondents.	
	I5 male: 'It means when I have something to do, I follow what I was taught' [P.2]	
	Given the misinterpretation of the statement it was apparent that the wording needed to be altered. The domain the item belongs to is 'organisational commitment' with the wording seeking to assess whether commitment to the organisation is sufficient to override a lack of understanding related to the tasks they are requested to perform. The wording was altered to indicate a lack of understanding.	
It is easy for me to keep going to get what I want (22)	This item was poorly understood across respondents. The key challenge appeared to be the 'keep going' element – that is the sense of whether the individual could make and sustain an effort when they anticipate a positive outcome. This proved elusive. The item was commonly understood as when working well rewards will follow and this will become 'easy' if performance is good.	N/A (excluded from measurement scale)
	I23 female: 'I understand this to mean that if I can fulfil what I am supposed to do (as VHT) it will become easy for me to get what I want' [P.6]	
	The item was also interpreted as what VHTs should do rather than asking about what they actually do. This was seemingly indicative of VHT respondents seeking to present themselves as understanding what is required of them as VHTs to the researcher.	
	I6 female: 'it means I should do the work with interest and not get lazy to perform my roles as a VHT so I can be able to achieve my goals in future. I should not be lazy in doing my work (respondent speaks with emphasis)' [P.7]	
	The common lack of understanding of the intended meaning of the item, as well as the lack of credible suggested alternatives, led to the decision to exclude the item from the measurement scale.	

I can solve most problems I face as a VHT if I invest the necessary effort (23)	This item drew a mixed response from respondents. More than half demonstrated their understanding of the item as intended.	I can solve most problems I have as a VHT if I work hard
	I11 female: 'It means the person is capable of handling all challenges that come their way as VHTs even if they are challenged' [P.4]	
	Several respondents nevertheless found the meaning confusing. The most challenging aspect was seemingly explaining the link between effort and problem solving. Several explained the item meaning in terms of VHTs being able to solve problems they face without mentioning any extra (or necessary) effort and certainly not making the causal link between effort and outcome.	
	I4 male: 'That statement means that the VHT can treat the child or can handle even cases that seem to be complicated for example when the child is convulsing, the VHT can handle that if not refer the child so that means that the VHT can handle these challenges' [P.4]	
	While the wording of the statement was clearly challenging for several respondents there was sufficient general understanding to persist with the item if the link between effort and outcome could be more clearly explained and simplified. By changing 'invest the necessary effort' to 'work hard' the fieldworkers believed this could be achieved.	

Table 4.10 contains the final wording of the twenty four items that comprised the VHT work motivation measurement scale included in the inSCALE VHT endline survey. This includes twenty two items retained following the cognitive interviews (NB: one item, item 22 from Table 4.8, was excluded), of which seven were altered, and two items that were developed directly from VHT quotes from interviews with Ugandan VHTs during the inSCALE project's formative research phase. Given these two items (i.e. items 23 and 24 in Table 4.10) were developed based on quotes from VHTs, suggestive of their construct validity, they were excluded from the cognitive interviews conducted with VHTs.

Table 4.10: Wording of VHT work motivation measurement scale items with item meanings and variable names (pre-item reduction)

Item no.	VHT work motivation measurement scale item wording	Item meaning	Variable name
1	In general, I am satisfied with my role as a VHT	Level of comfort or contentment with VHT work and working conditions.	FSTATIS
2	I think the work I am asked to do is worth the time I spend on it	Perceived value of VHT work	FWORTH
3	The work I do as a VHT provides me with what I need	Perception of the potential personal benefits of the role – financial and / non-financial	FNEED
4	It is important that I do a good job as a VHT so that the VHT programme works well	Sense of ownership of the role due to being in collective interests for it to succeed	FWORKS
5	I am respected in my community for the work I do as a VHT	Perception of local esteem in which they are held by virtue of their role	FRESPEC
6	At the moment I don't feel like working as hard as I can	How hard respondent is prepared to work right now	FMOTIVA
7	I only do this job for the benefits that come with it	Perception of value of the role based on extrinsic rewards	FBENEIT
8	I feel like performing the duties required of me as a VHT	Sense of motivation to undertake the key tasks of a VHT	FPERF
9	I am proud to be working as a VHT	Pride in VHT role	FPROUD
10	I feel committed to my VHT role	Level of dedication to VHT role	FCOMMIT
11	What the VHT programme wants to achieve and what I want to achieve are the same	Sense of whether the respondent sees their goals and the goals of the programme as aligned	FACHIEV
12	I intend to stop working as a VHT	Whether the worker planning to or knows they will leave the VHT programme soon	FSTOP
13	I can complete all of the work I am expected to do	Whether the workload is considered to be manageable	FCOMPLE

14	I am willing to do more than is asked of me as a VHT	Whether the VHT is sufficiently committed to do extra work that they recognise is needed in their VHT role	FWILL
15	Sometimes I don't understand why I am asked to do certain things as a VHT but I do them anyway	Whether the VHT is sufficiently committed to perform the work tasks they know they are obliged to without knowing why	FSENSE
16	Those VHTs who are best at their job are the ones who get the most benefits	Perception of whether those who are good at their work are recognised and rewarded	FBEST
17	The VHT programme provides everything I need to do my job properly	Whether the VHT feels they have access to the necessary tools to do their job properly	FEVERY
18	I expect to stay working as a VHT in the future	Whether the VHT anticipates being able to remain in role	FSTAY
19	Suggestions made by VHTs on how to improve their work are usually ignored by supervisors	Whether supervisors are interested in ideas and suggestions and issues that come from the VHT	FIGNORE
20	The supervision of my work is good	Perception of the quality of their supervision	FGOOD
21	If I do well as a VHT I will achieve my goals	Perception of VHT role performance leading to personal goal realisation	FDREAMS
22	I can solve most problems I have as a VHT if I work hard	Perception of their own capacity to be effective as a VHT when they try	FSOLVE
23	I gain knowledge from being a VHT	Perception of the VHT role enabling them to learn	FKNOW
24	My work is important because I help people	Sense of value according to role by virtue of it being altruistic	FHELP

4.5.3 Construct validity 2: assessing scale item contribution to the construct of 'work motivation' leading to the estimation of VHT work motivation scores

This section uses data from the inSCALE VHT endline survey in Uganda and accepted statistical tests to examine whether the VHT work motivation measurement scale has construct validity. That is, whether the included scale items actually contribute to a measure of VHT work motivation. It was anticipated that several items would, as a result of the tests, be eliminated due to missing data, correlation between items and low factor loadings in line with previous experience with similar measurement scales (Chandler et al., 2009, Morrison et al., 2015)[24].

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[24] NB: While Morrison et al (2015) implemented tests that could have led to scale item exclusion, based on results of the tests they ran, no items were.

The account provided here begins with the details of the sampled VHTs followed by the results of the item reduction techniques and an account of the results of the exploratory factor analysis. The section concludes with different modes of calculating VHT work motivation scores.

VHT work motivation and social identification measurement scale sample

The VHT work motivation and social identification measurement scales were administered to 306 VHTs across 8 Districts[25] in the inSCALE implementation area of Western Uganda in April and May 2014 (see Chapter 1 for the full details of inSCALE's operations). Of the 306 respondents, eight failed to provide a response to items and they were removed from the analysis leaving n=298 respondents who completed the full measurement scales. 170 of the interviewed VHTs were male and 128 female with most aged between 30 and 50 years (65%). There was an even spread of respondents from intervention arms with 34.5% (103) sampled from the control arm, 32.5% (97) from the technology intervention arm and 33% (98) in community intervention arm. Table 4.11 presents the number of respondents sampled in each District by intervention area. The majority of respondents reported being Christian (91%) and married (83%) with 56% having completed primary school education. 88% reported that they were self-employed as either farmers or fishermen.

Table 4.11: VHT respondent numbers by District and intervention arm

District name	Intervention arm			Total
	Control	Community	Technology	
Buliisa	9	31	5	45
Hoima	27	32	26	85
Kibaale	12	0	14	26
Kiboga	9	0	9	18
Kiryandongo	7	7	13	27
Kyankwanzi	18	0	9	27
Kyegegwa	6	6	13	25
Masindi	15	22	8	45
Total	103	98	97	298

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[25] Buliisa, Hoima, Kibaale, Kiboga, Kiryandongo, Kyankwanzi, Kyegegwa and Masindi.

VHT work motivation measurement scale item reduction

The variable 'FHELP' ('my work is important because I help people') was used as the reference variable in a bysort analysis of all motivation variables for directionality due to the strong suggestion from the formative research findings that it was indicative of VHT work motivation. Only one variable did not perform as expected in terms of response directionality when compared to 'FHELP'. This variable, 'those VHTs who are best at their jobs are the ones who get the most benefits' ('FBEST'), also performed unexpectedly when cross checked against two other variables that the formative research suggested were indicative of motivation; 'I gain knowledge from being a VHT' ('FKNOW') and 'I am respected in my community for the work I do as a VHT' ('FRESPEC'). That is, as scores on 'FBEST' were low, scores recorded for variables 'FHELP', 'FKNOW' and 'FRESPEC' were not similarly low. Running contrary to the other variables may indicate that 'FBEST' is not a sound motivational indicator. It may also indicate that the perception of reward for effort for this population is impacting on their motivation in an unpredicted way. A larger sample size than has been used for this study may be required to explore this effect further. The item 'FBEST' was retained at this stage of the analysis due to this ambiguous result and the challenge it represented to interpretation.

A polychoric correlation analysis revealed that the variable 'FCOMMIT' ('I feel committed to my VHT role' - see Table 4.10 for item wording and variable names[26]) was correlated with 'FPROUD' ('I am proud to be working as a VHT') (.69) and with 'FPERF' ('I feel like performing the duties required of me as a VHT' (.65) at >65% and was removed from the scale as a result. The item 'my work is important because I help people' (variable 'FHELP') was also removed from the analysis because >80% of respondents (80.87%) provided the same response (i.e. 'strongly agree'). It also correlated with 'FKNOW' ('I gain knowledge from being a VHT') (.721) at >65%. This approach is consistent with other recent measurement scale item reduction approaches (Olatunji et al., 2007, Chandler et al., 2009). A matrix of the correlation coefficients appears in Appendix 9.9 (Table 9.3).

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[26] In Chapters 4 and 5 the first mention of the item includes the full item wording as well as the abbreviated variable name. Subsequent mentions include just the variable name. When referring to the 'item' the item wording appears first, when referring to the 'variable' the variable name appears first.

Exploratory factor analysis

The initial (pre-rotation) exploratory polychoric factor analysis on the twenty-two remaining VHT work motivation variables revealed that four did not load to the required level (.4) on any of the five factors[27] proposed (Chandler et al., 2009). These were 'FWORTH' ('I think the work I am asked to do is worth the time I spend on it'), 'FNEED' ('the work I do as a VHT provides me with what I need'), 'FSENSE' ('sometimes I don't understand why I am asked to do certain things as a VHT but I do them anyway') and 'FEVERY' ('the VHT programme provides everything I need to do my job properly'). Just one variable loaded >.4 on the fourth factor ('FIGNORE' – 'suggestions made by VHTs on how to improve their work are usually ignored by supervisors') and none on the fifth factor. A scree test indicated that three factors described 88% of the data with the first two factors generating eigenvalues of >1 and the third, an eigenvalue of .98. The results of the scree test from the initial factor analysis are plotted in Figure 4.3 where each dot on the graph indicates the relative contribution of the 22 variables to the overarching construct of VHT work motivation. Despite the third factor recording an eigenvalue of just below 1 it was included as the variables that loaded highest on it seemed to have a common theme. That is, 'FMOTIVA' ('at the moment I don't feel like working as hard as I can'), 'FBENEFIT' ('I only do this job for the benefits that come with it'), 'FBEST' ('those VHTs who are best at their job are the ones who get the most benefits'), 'FGOOD' ('the supervision of my work is good') and 'FSOLVE' ('I can solve most problems I have as a VHT if I work hard') all indicate a form of reward for effort. This is in terms of 'benefits' in the case of 'FBENEFIT' and 'FBEST', in terms of external recognition in the case of 'FGOOD', and in terms of intrinsic reward in the case of 'FSOLVE'. While the latent influence of this factor on VHT work motivation warrants further examination, ideally with a larger sample size, it does nevertheless resonate with some of the themes generated from qualitative analysis of VHT interviews presented in Chapter 6. For these reasons scale items

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[27] When running exploratory FA in Stata it is necessary to nominate a number of anticipated factors. According to the design of the measurement scale, it could have been anticipated that two factors relating to internal and environmental motivation would be found. Given no measurement scale for estimating VHT work motivation had previously been implemented, the aim was to assess whether there were additional or alternative, underlying influences on work motivation. For this reason five factors were proposed as a reasonable balance between parsimony and plausibility. Loadings for each of the five factors were calculated which indicated the relative contribution of each variable to each factor. The scree test of all factors (one for each of the 22 variables) was used to determine the relative contribution made by each to the overarching construct of VHT work motivation. The optimum number of factors included was made based on this analysis (Fabrigar et al., 1999).

that loaded most strongly on the third factor were included in the final measurement scale composition.
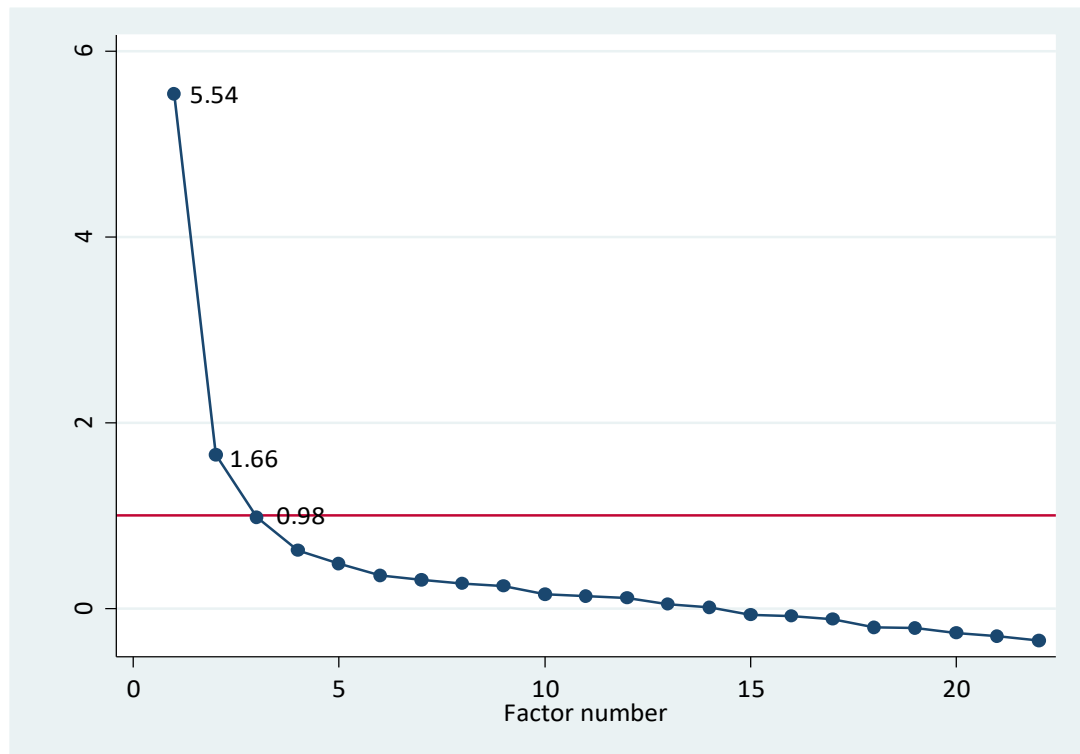
Figure 4.3: Scree plot of eigenvalue after factor analysis on 22 VHT work motivation variables

The polychoric factor analysis was run once again for the twenty-two items but this time specifying three factors. The variable 'FIGNORE', as well 'FWORTH', 'FNEED', 'FSENSE' and 'FEVERY' did not load to .4 on any of the three factors. These five variables were removed leaving seventeen VHT work motivation variables.

The polychoric rotated or promax factor analysis proposing three factors on the remaining seventeen variables showed that all but one variable loaded >.3 on at least one factor which was the criterion for item inclusion post rotation adopted based on Chandler et al's method (2009). The variable 'FGOOD' loaded at just .25 on the third factor. It was nevertheless retained for three reasons:

1. The formative research indicated that VHTs valued the frequency and quality of supervision and reported that it influenced their work motivation (see Chapter 3).
2. The other variable that referred to supervision ('FIGNORE') had already been removed meaning that should 'FGOOD' be similarly removed there would be no item left capturing the potential influence of supervision on VHT work motivation.

3. Removal of 'FGOOD' decreased rather than increased the Cronbach's alpha of the measurement scale indicating that it was less internally consistent with 'FGOOD' removed than it would be with it retained. The Cronbach's alpha of the measurement scale is discussed further below.

Internal consistency of the VHT work motivation measurement scale

In this section conventional measures of scale consistency are applied to assess whether included variables contributed to the overarching latent construct of VHT work motivation.

In the factor analysis the variable 'FSTAY' ('I expect to stay working as a VHT in the future') loaded .51 on the second factor and .4 on the first. While the aim was to have no or few cross loadings, the item was retained for two reasons; firstly, along with FSTOP ('I intend to stop working as a VHT'), FSTAY loaded on the second factor indicating a discrete, latent influence of retention in role on VHT motivation. Secondly, when FSTAY was removed from the measurement scale, the remaining sixteen variables returned a Cronbach's alpha of .64 and the measurement scale's internal consistency dropped below the conventionally acceptable level.

 'FBEST' as noted above did not perform as expected during the bysort analysis (an analysis that indicates whether scores on individual variables are in the predicted direction). FBEST comes from the organisational justice domain and refers to the fair allocation of work benefits (see Table 1). When this variable was removed from the scoring the Cronbach's alpha rose to .68. When the other item that directly addresses benefits was also removed from the analysis, 'I only do this job for the benefits that come with it' ('FBENEFIT'), the Cronbach's alpha rose to .72. While it may seem counterintuitive to retain items that appear to increase the measurement scale's internal consistency when removed, their retention was nevertheless considered to be warranted. The equity of benefits and their relationship to effort and recognition appears to have latent influence on VHT work motivation. The variables 'FBEST' and 'FBENEFIT' loaded >.4 on the third factor ('reward for effort') in the rotated promax factor analysis albeit - one negatively ('FBENEFIT' -.47)[28] and one positively

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[28] The negative factor loading of the variables 'FBENEFIT' and 'FMOTIVA' support claims of measurement scale validity. This is because as respondents indicate they 'only do this job for the benefits that come with it' and 'at the moment I don't feel like working as hard as I can' their motivation decreases. This is in line with theory and expectation and supports the sensitivity of the measurement scale.

('FBEST' .47). This influence warrants further examination with a larger sample and for this reason the variables 'FBEST' and 'FBENEFIT' were retained.

The seventeen remaining motivation variables together recorded a Cronbach's Alpha of .67, with a score of .7 is considered 'acceptable' (Bland and Altman, 1997). The final VHT work motivation measurement scale items appear in Table 4.12.

Table 4.12: Final VHT work motivation measurement scale items

No.	Final measurement scale item wording
1	In general, I am satisfied with my role as a VHT
2	It is important that I do a good job as a VHT so that the VHT programme works well
3	I am respected in my community for the work I do as a VHT
4	I feel like performing the duties required of me as a VHT
5	I am proud to be working as a VHT
6	what the VHT programme wants to achieve and what I want to achieve are the same
7	I can complete all of the work I am expected to do
8	I am willing to do more than is asked of me as a VHT
9	If I do well as a VHT I will achieve my goals
10	I gain knowledge from being a VHT
11	I intend to stop working as a VHT
12	I expect to stay working as a VHT in the future
13	At the moment I don't feel like working as hard as I can
14	I only do this job for the benefits that come with it
15	Those VHTs who are best at their job are the ones who get the most benefits
16	The supervision of my work is good
17	I can solve most problems I have as a VHT if I work hard

Were individual and environmental motivation latent influences on VHT work motivation?

A key aspect of assessments regarding the discriminant validity of the VHT work motivation measurement scale related to whether it could discern between the two theoretical work motivation domains of 'individual' and 'environmental' motivation proposed by Chandler et al (2009) and utilised in measurement scale design. Table 4.13 shows the factors, item statements and factor loading score for each of the seventeen items and their domains included in the final VHT work motivation measurement scale.

Variables were proposed to load onto two factors indicative of the theoretical domains 'individual' and 'environmental' motivation[29]. They instead loaded on three factors. Indeed one domain had items spread across Factors 1 and 3 (the self-reported 'motivation' domain). The factor analysis was therefore unable to confirm the proposed two-factor model (individual and environmental). The results do however suggest that the first factor is primarily influenced by variables designed to be indicative of individual motivation as this domain contributed nine of the ten items that loaded most heavily on this factor. The single environmental variable that loaded onto the first factor, 'FRESPEC' ('I am respected in the community for the work I do as a VHT'), may have been misallocated during the design of the instrument or interpreted differently by respondents.

The variables loading primarily on the first factor could potentially be used to derive a motivation score as the Crobnbach's alpha (α = .77) suggests internal consistency. Given the emphasis in the literature on the importance of the domains not included in the first factor, many of which relate to environmental influences, such a measure would be theoretically partial (Bhattacharyya et al., 2001, Franco et al., 2002, Chandler et al., 2009, Strachan et al., 2015).

The first factor, which contained the majority of variables, seemingly relates to and has been termed 'general motivation'. The second factor seemingly relates to VHT 'retention in role' while the third factor, as mentioned, seemingly relates to VHT perceptions of 'reward for effort'. With regard to the discriminant validity of the measurement scale, while the predicted two factor structure was not confirmed, the three factors that were discovered are credible. The rationale for this and implications are explored in the Discussion section.

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[29] Table 4.13 indicates whether each included domain was proposed to load on 'internal' or environmental' motivation with colour coding.

Table 4.13: factor structure showing item weighting on each of three factors for VHT work motivation domains and variables (n=298)

Domain	Variable names and item statements	Median response [b]	Item loadings [a] General motivation factor α = 0.77	Retention in role factor α = 0.53	Reward for effort factor α = 0.48
			α = 0.67		
Job satisfaction	❶ 'FSATIS': In general, I am satisfied with my role as a VHT [c]	1	0.36		
Needs satisfaction	❷ 'FWORKS': It is important that I do a good job as a VHT so that the VHT programme works well [c]	1	0.68		
Community respect	❸ 'FRESPEC': I am respected in my community for the work I do as a VHT [c]	1	0.49		
Motivation	❹ 'FPERF': I feel like performing the duties required of me as a VHT [c]	1	0.73		
Programme commitment	❶ 'FPROUD': I am proud to be working as a VHT [c]	1	0.69		
Goal congruence	❷ 'FACHIEV': what the VHT programme wants to achieve and what I want to achieve are the same [c]	2	0.54		
Workload	❶ 'FCOMPLE': I can complete all of the work I am expected to do [c]	2	0.56		
Organisational citizenship	❹ 'FWILL': I am willing to do more than is asked of me as a VHT [c]	1	0.75		
Outcome expectancy	❷ 'FDREAMS': If I do well as a VHT I will achieve my goals [c]	2	0.62		
Knowledge gain	❺ 'FKNOW': I gain knowledge from being a VHT [c]	1	0.84		
Intention to leave	❶ 'FSTOP': I intend to stop working as a VHT	5		0.93	
Job security	❶ 'FSTAY': I expect to stay working as a VHT in the future [c]	1		0.51	
Motivation	❶ 'FMOTIVA': At the moment I don't feel like working as hard as I can ❶ 'FBENEFIT': I only do this job for the benefits that come with it	3 4			-0.46 -0.47
Organisational justice	❶ 'FBEST': Those VHTs who are best at their job are the ones who get the most benefits [c]	3			0.47
Supervision	❹ 'FGOOD': The supervision of my work is good [c]	2			0.25

Self-efficacy	❹ 'FSOLVE': I can solve most problems I have as a VHT if I work hard[c]	2			0.57

Statement key: ❶ Adapted from Chandler et al (2009); ❷ Created for this measurement scale based on review of literature (see Chapter 2 and section 1 Chapter 6); ❸ Created for this measurement scale based on review of literature (see Chapter 2 and section 1 Chapter 6) and qualitative analysis (see Chapter 4 and section 1 Chapter 6); ❹ Adapted from measures shared by S Alexander Haslam (Haslam, 2011); ❺ Created for this measurement scale based on qualitative analysis (see Chapter 4 and section 1 Chapter 6).

Shaded pink are domains originally proposed to indicate internal motivation. Shaded green are domains originally proposed to indicate environmental motivation.

[a] Showing factors loading > .30 after promax (oblique) rotation
[b] Response scale 1-5, 'strongly agree' to 'strongly disagree'
[c] Item was reverse coded when included in the aggregate score so higher score indicated higher motivation

Generating a VHT work motivation score

Five, different methods were used to estimate a VHT work motivation score. These were:

1. An unweighted score estimated by summing the original responses of the participants for each Likert scale item[30]. This score is called the 'raw' motivation score'.

2. A score compiled using data driven weights for each contributing variable specified through factor analysis. For this factor based score, scores were weighted by the coefficients from the rotated factor analysis (Table 4.13). This was done with the aim of accurately reflecting the relative contribution of each variable to the latent construct of VHT work motivation. This approach is consistent with that adopted by Chandler et al (2009). This score is called the 'data weighted' motivation score.

3. A factor based score where each factor is assigned equal weight. This score assumes variables indicative of *general motivation*, *retention in role* and *reward for effort* must have equal weighting within the scale The mean variable scores in each identified factor are summed. This score is called the 'mean factor' motivation score.

4. A factor based score where weights for each factor are determined by qualitative findings (Chapter 6). This score weights combined *general motivation* variables as contributing 50% of the total VHT work motivation score, *retention in role* variables 20% and *reward for effort* variables 30%. This was based on the rationale that variables contributing to the first factor were varied and theoretically and qualitatively important to VHT motivation. The second factor and third factors also contained theoretically and qualitatively important variables but fewer of them and in the case of the second factor,

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[30] After items, where necessary, were reverse coded to ensure a higher score indicated higher motivation.

a single issue (i.e. the ability and intention to remain in or leave the VHT role). This score is called the 'qualitative weighted' motivation score.

5. In the section on measurement scale reliability below, the difference in scores generated from surveys collected by one fieldworker is highlighted. A fifth VHT work motivation score was generated by removing scores collected by this fieldworker from the 'data weighted' motivation score. This score is called the 'no fieldworker 1' motivation score.

The correlation between these scores is displayed in Table 4.14. This table shows that all scores are strongly, positively correlated with each other. In the next section, how these scores vary against variables predicted to influence or not influence VHT work motivation is examined. This leads to the selection of the final mode of scoring.

Table 4.14: correlation between five different VHT work motivation scores

Motivation score	Raw	Data weighted	Mean factor	Qualitative weighted
Raw	1			
Data weighted	.9			
Mean factor	.66	.57		
Qualitative weighted	.73	.69	.97	
No fieldworker 1	.89	.99	.57	.69

4.5.4 Criterion validity: performance of VHT work motivation scores against key variables

The criterion validity of the VHT work motivation score estimates was explored using descriptive analysis as explained in the Methods section. In this section the results for assessments of predictive and concurrent validity are presented.[31]

Predictive and concurrent validity

With regard to predictive validity, correlation coefficients were calculated for the five VHT work motivation scores and variables indicative of workload, supervision and drug supply. These can be found in Table 4.15.

- As higher scores on the two workload variables were indicative of increased workload, a negative linear relationship with the VHT work motivation scores was predicted. No statistically significant linear relationships were detected between workload and VHT work motivation scores.

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[31] Results for discriminant validity checks have been presented in the previous section related to construct validity.

Table 4.15: Correlation coefficients for five modes of VHT work motivation score and key comparison variables

Key variable	'Raw' motivation score	'Data weighted' motivation score	'Mean factor' motivation score	'Qualitative weighted' motivation score	'No fieldworker 1' motivation score
	Correlation between work motivation score estimates and key variables				
n	298	298	298	298	250
Workload 1	-.06	-.09	-.03	-.04	-.1
Workload 2	-.05	-.08	-.04	-.04	-.1
Supervision	-.03	-.04	.04	.03	.06
Drug supply 1	.03	-.06	.13*	.1	-.04
Drug supply 2	-.01	-.05	.05	.03	-.08

*$p<.05$

- As higher scores on the supervision variable were indicative of increased levels of supervision, a positive linear relationship with the VHT work motivation scores was predicted. No statistically significant linear relationships were detected between supervision and VHT work motivation scores.

- As higher scores on the two drug supply variables indicated lower drug availability, a negative linear relationship was predicted. A weak, positive but statistically significant linear relationship was recorded between the 'mean factor' VHT work motivation score and VHT drug supply 1 ($p<.05$). No other, statistically significant linear relationships were detected between the two drug supply variables and VHT work motivation scores.

On the basis of these results (i.e. a single, statistically significant result indicating a relationship), it is not possible to conclude any of the five modes of scoring VHT work motivation have predictive validity. This is discussed further in the next section.

With regard to concurrent validity, it was proposed that mean VHT work motivation scores would be higher in the inSCALE intervention areas than in the control area. Table 4.16 displays the mean, median and standard deviation scores for the five modes of scoring VHT work motivation proposed by intervention area. Independent samples t-tests were conducted to compare mean VHT work motivation scores in each intervention area against control for each mode of scoring.

Table 4.16: Mean VHT work motivation scores by intervention arm

Mode of motivation score	Intervention arm								
	Control (n=103)			Community (n=98)			Technology (n=97)		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
'Raw'	71.48	71	5.7	71.41	72	5.64	71.76	72	4.71
'Data weighted'	6.32	6.4	.49	6.19	6.19	.52	6.37	6.54	.47
'Mean factor'	9.78	9.9	1.11	10.2**	10.1	1	9.86	9.9	1.07
'Qualitative weighted'	3.39	3.43	.33	3.49*	3.47	.33	3.42	3.44	.31
'No fieldworker 1' (n)	6.49 (94)	6.58	.49	6.45 (71)	6.6	.52	6.59 (85)	6.72	.45

*p=<.05, **p=<.01

- VHTs in the community intervention area scored statistically significantly higher on the 'mean factor' VHT work motivation score when compared to control (p=<.01).
- VHTs in the community intervention area scored statistically significantly higher on the 'qualitative weighted' VHT work motivation score when compared to control (p=<.05).

No other statistically significant differences in mean scores were found for intervention and control areas for the different VHT work motivation modes of scoring. On the basis of these results (i.e. just two, statistically significant results indicating a significant difference in mean scores between intervention area and control), it is not possible to conclude any of the five modes of scoring VHT work motivation have concurrent validity. This is discussed further in the next section including consideration of the generally high scores recorded and whether this result suggests a lack of impact of the interventions.

4.5.5 Selecting the most appropriate VHT work motivation score

It was not possible to conclude whether the different modes of scoring VHT work motivation did or did not have criterion validity based on the results. There was insufficient evidence for the predictive and concurrent validity of the scoring approaches while the lack of evidence for the discriminant validity of the scale has already been noted[32].

With regard to predictive validity, the only statistically significant linear relationship detected was between 'mean factor' VHT work motivation and the drug supply 1 variable. This

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[32] See the results section related to 'construct validity' where the results of factor analysis were drawn on to conclude that 'internal' and 'environmental' motivation did not have a discernible, discrete influence on VHT work motivation. This result ran contrary to predictions based on the discriminant validity of the scale. These results were presented earlier in the Chapter because they also related to the final scale item composition required for generating scores.

relationship was not in the predicted direction. With regard to concurrent validity, higher mean scores were detected in the community intervention area than in the control area for the 'mean factor' and 'qualitative weighted' VHT work motivation scores. This was in line with predictions. These two modes of scoring did not generate scores that were statistically significantly different in the technology arm when compared to control. While it may be the case that the community based intervention was more effective in influencing VHT work motivation than the technology based intervention, this was not what was predicted. It is also worth noting that high scores were found for all five of the different VHT work motivation modes of scoring across the intervention arms.

It does appear that VHTs are highly motivated to work and that this may have been the case prior to intervention. If motivation was already high, it may also be the case that the sample size may be underpowered to detect what appear to be small variations in motivation across intervention areas. The possibility of social desirability bias influencing the consistently high scores is also possible. A further issue relates to utilising the inSCALE intervention areas as a variable for assessments of concurrent validity. The interventions had not previously been implemented. As a result there is no *a priori* data related to their impact on VHT work motivation. It was proposed that the interventions would influ ence VHT work motivation but it was a bold prediction based on theoretical assumptions. This result should therefore be interpreted with caution. Issues relating to the seemingly high, pre-existing levels of work motivation are explored further in the Discussion section.

There is very little evidence upon which to make an assessment of the most appropriate VHT work motivation score to adopt. In the absence of such evidence, the 'data weighted' mode of scoring was the VHT work motivation scoring method selected. The rationale was that this mode of scoring is consistent with the approach used by Chandler et al (2009), whose scale development and testing approach was followed in VHT work motivation scale development.

Descriptive statistics for the VHT work motivation score

The mean VHT work motivation score was 6.29 with a median of 6.4, a standard deviation of .5, a lowest score of 4.59 and a highest score of 7.09[33]. The distribution of the VHT work motivation score among the VHT sample is presented in Figure 4.4. The distribution was moderately skewed to the left (skewness = -.57) with a heavy tail as indicated by the positive

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[33] The VHT work motivation score is referred to as the 'data weighted' motivation score in Table 4.15.

kurtosis (kurtosis 2.55) (McNeese, 2010, Field, 2013). Despite the moderate skew and heavy tail of the distribution, the distribution falls within the conventionally accepted parameters of 'normality' such that parametric statistical tests may be applied (though there is little apparent consensus on cut-offs) (Kline, 2005). The two measures of central tendency (i.e. mean and median) were only slightly different with a small variance score of .25. The motivation of the sampled VHTs was high, according the VHT work motivation measurement scale. This was indicated by a mean, raw per item score of 4.2 out of 5. A score of 4 indicated agreement with a statement indicative of motivation with a score of 5, strong agreement.
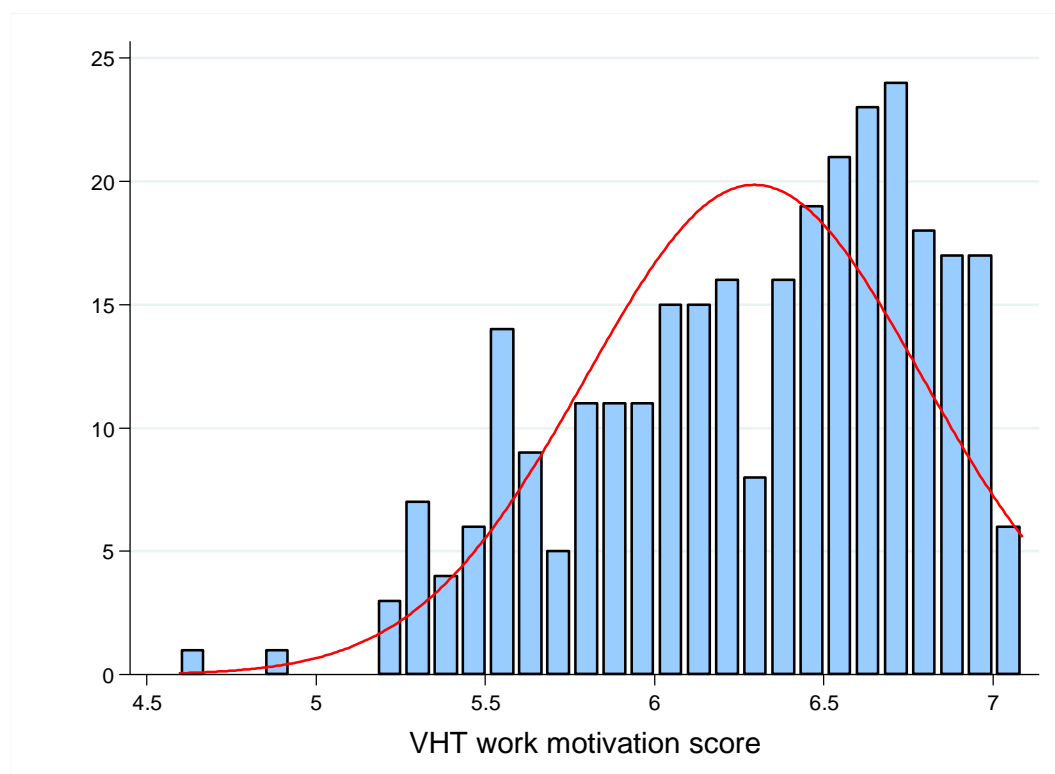
Figure 4.4: Distribution of VHT work motivation scores

4.5.6 Reliability: assessing VHT work motivation measurement scale consistency

The seventeen item VHT work motivation measurement scale produced a Cronbach's alpha of .67 as reported in section 2.4 above. This is considered acceptable for the results of measurement scales to be used for research purposes (Bland and Altman, 1997, Streiner and Norman, 2008).

The intraclass correlation coefficient for VHT work motivation by the sub-county of the VHT was 0.05 (95% CI 0.00-0.13). That is, approximately 5% of variation in the VHT work

motivation scores was due to variation between clusters, the rest is due to variation between VHTs.

The intraclass correlation coefficient for VHT work motivation by the fieldworker who administered the measurement scale was 0.27 (95% CI 0.04-0.49). That is, approximately 27% of variation in the VHT work motivation scores is due to variation between fieldworker administrators of the measurement scale, the rest is due to variation between VHTs. In further sensitivity analysis it was discovered that a large proportion of this variation was driven by one fieldworker, one of ten who collected survey data. 'Fieldworker 1' recorded a mean VHT work motivation score of 5.81 (SD .37, median 5.78) among sampled VHT respondents. Eliminating data collected by fieldworker 1 from the analysis brought down the intraclass correlation coefficient to .1 (95% CI 0.00-0.22). That is, approximately 10% of variation in the VHT work motivation scores was due to variation between fieldworker administrators of the measurement scale, the rest was due to variation between VHTs. A VHT work motivation score was calculated without data collected by fieldworker 1 to assess the impact on VHT work motivation scores. Scores were found to vary little in comparison with a VHT work motivation score calculated with a complete dataset (i.e. with scores from fieldworker 1 retained). Fieldworker 1's data were retained in consideration of this finding and that they collected data across sub-counties, completing 48 surveys out of a total of 298.

Future use of the VHT work motivation measurement scale should control for clustering and fieldworker effects on VHT work motivation.

4.6 Discussion

The seventeen item VHT work motivation measurement scale was the product of a development process that aimed to produce a practical, valid and reliable measurement tool. This section reviews how successfully this aim was achieved.

This chapter has described the methods and presented the results of content, construct and criterion validity tests as well as tests for scale reliability. In so doing it has been concluded that:

- The scale items have good content validity as they were developed based on the available CHW work motivation literature, work motivation theory and research with Ugandan VHTs.

- With regard to construct validity:
  - The scale items were found to be understood by and acceptable to Ugandan VHTs according to analysis of VHT interview and fieldworker debrief data; this indicates promising construct validity.
  - Construct validity tests followed accepted methods but failed to confirm the predicted factor structure of 'internal' and 'environmental' motivation. They instead indicated three factors that had latent influence on VHT work motivation; *general motivation*, *retention in role* and *reward for effort*. This finding is supported by qualitative data from the formative research (Chapter 3) and associative interviews with VHTs presented in Chapter 6
- Straightforward claims regarding criterion validity were confounded by the generally high VHT work motivation scores recorded; a result mirrored by results in comparable settings (discussed with specific examples below). The possibility of the measurement scale lacking sensitivity, the sample being underpowered or VHTs being highly motivated all appear plausible in light of these results.
- Claims of reliability were supported by the combined items producing scores at an acceptable threshold on measures of internal consistency.

Each of these key conclusions is discussed in light of the results presented in this chapter and, where appropriate, previous research. The utility of the measurement scale for use with Ugandan VHTs and CHWs operating in other settings is explored. The chapter concludes with a comment regarding the stated aim of establishing the extent to which the proposed VHT work motivation measurement scale actually measures VHT work motivation.

4.6.1 Content validity of the VHT work motivation measurement scale

The methodical approach taken to the development of the VHT work motivation measurement scale contributed to confidence that appropriate dimensions of the construct were included and that this aspect was not 'deficient' (Kanfer et al., 2012) and therefore invalid (Messick, 1995). As discussed in earlier sections a breadth of research data and theoretical literature, as well as the findings of formative research conducted with VHTs was reviewed when assessing appropriate motivational dimensions to include. Decisions on measurement scale design and the dimensions and items also included an assessment of qualitative research findings from interviews conducted with Ugandan VHTs. This process was consistent with that adopted previously for comparable measurement scales (Chandler

et al., 2009, Morrison et al., 2015). The findings provided evidence of VHT understanding of key words, concepts, survey structure and accompanying images. The process followed and the results generated and reported in his chapter indicate that the VHT work motivation measurement scale had content validity.

4.6.2 Construct validity of the VHT work motivation measurement scale

Important modifications to measurement scale format and item wording made based on qualitative 'cognitive' interviews with VHTs

The structure and wording of measurement scale items was examined using the cognitive validation methodology (Campanelli, 1997, De Silva et al., 2006). Through this method it became clear that certain words and expressions were misleading and unlikely to be valid and they were removed or altered as a result. In some cases seemingly problematic words or phrases were retained in the absence of strong alternatives. In other cases additional words were added to aid understanding. The rigour and cross – checking involved when implementing the cognitive validation methodology seemingly enabled the measurement scale items to be altered in such a way as to make them better understood and acceptable to VHTs. The high response rate for the VHT work motivation measurement scale implemented within the inSCALE project endline survey supports this conclusion. This claim is consistent with those of the authors of a similar, recently developed measurement scale (Morrison et al., 2015).

Capturing data utilising fieldworkers fluent in local languages and from the areas where the research was conducted also yielded important findings. Fieldworkers made a number of suggestions regarding the adaptation of measurement scale wording. A focus on fieldworker feedback also revealed that there were some words and concepts that fieldworkers, as well as VHTs, misinterpreted. This was notably the case when one fieldworker was found to have paraphrased the meaning of Item 16 to mean 'nonsense' instead of 'doesn't make sense'. When combined with VHT misunderstanding of the item, a decision to alter the item was taken. It also led to a renewed emphasis on the importance of fieldworker understanding of scale items during their training. No notable differences in VHT testimony based on gender were identified in the data analysis though a more explicit gender focus may have yielded more nuanced insights.

Upon reflection, the data also signalled challenges that became more apparent later in the development process. For instance, in hindsight, changing item wording from 'I can't complete all of the work I am expected to do' to 'I can complete all of the work I am expected to do' (item 13) may not have helped counteract social desirability bias. The results from the cognitive validation exercise indicated respondents were anxious about appearing to be reluctant to do the work. While switching from 'can't' to 'can' may have reduced anxiety, it may have also promoted agreement with the item.

These results support claims that an examination of the cognitive validity of measurement scale items is an important addition to traditional measures of scale validation in different cultural settings (De Silva et al., 2006). By enabling improved understanding and acceptability of scale items this method improved the construct validity of the VHT work motivation measurement scale.

Three latent influences on VHT work motivation detected through factor analysis: *general motivation*, *retention in role* and *reward for effort*

Measurement scale construct validity was also assessed through examination of the latent influences on overall VHT work motivation. This followed item reduction techniques based on previously utilised approaches (Chandler et al., 2009). The work motivation domains included in the measurement scale were proposed to contribute to two, discrete latent influences on VHT work motivation: internal and environmental motivation. Examination of the factor analysis scores generated by the VHT work motivation measurement scale with VHTs instead indicated that there were three latent influences on overall VHT work motivation. Based on the composition of the items that loaded onto each of these three factors it was concluded that they related to; *general motivation*, *retention in role* and *reward for effort*.

While items proposed to be indicative of individual motivation loaded on all three factors, they comprised nine of ten first factor, or general motivation, factor items. Alone these ten general motivation items were found to be internally consistent ($\alpha = 0.769$) and, as a result, could theoretically be used as a standalone VHT work motivation measurement scale (Bland and Altman, 1997). Given the emphasis in the literature on the importance of contextual or environmental influences on community health worker motivation a VHT work motivation measurement scale that did not include items indicative of these influences would be partial (Bhattacharyya et al., 2001, Franco et al., 2002, Mueller et al., 2005, Chen and Kanfer, 2006,

Chandler et al., 2009, Kok et al., 2015b). Instead, as the results indicated that *retention in role* and *reward for effort* were latent influences on work motivation, items in these factors were included in the final VHT work motivation measurement scale. Exploratory factor analysis groups items based on response patterns without being able to account for how items may relate in perception for a respondent (Borghi et al., 2017). For this reason, respondents may feel similarly motivated by items that have been designed as indicating individual and environmental motivation and the exploratory factor analysis groups them as indicative of the same underlying factor. They may still be importantly different, both theoretically and qualitatively, and warrant further investigation.

The three factor structure, especially with regard to the third or *reward for effort* factor resonate with the qualitative findings reported in Chapter 6. As a result there is some evidence for the construct validity of the VHT work motivation measurement scale. Mbindyo et al (2009) also confirmed a three factor or latent construct structure in their scale albeit with paid health workers in Kenyan hospitals. These factors related to organisational commitment (1st factor), conscientiousness, timeliness and attendance (2nd factor) and general motivation, job satisfaction and burnout (3rd factor). While there is some correspondence in results (e.g. organisational commitment domains appearing in the first factor of the VHT work motivation measurement scale), the composition of items and target group was quite different. No other studies with similar results in terms of work motivation measurement scale factor structure were found.

The domains of motivation that contribute to the third, or *reward for effort* factor relate to self-reported motivation ('FMOTIVA' and 'FBENEFIT') and self-efficacy as well as the environmental domains of organisational justice and supervision. This would appear to indicate a latent influence on VHT work motivation of some kind of interaction between working conditions, reward for effort (in terms of recognition and benefits) and how effective VHTs feel they can be in their work. This effect is discussed further in Chapter 6 based on qualitative research findings with VHTs which examine, in particular, the critical contributory role played by drug availability to VHT notions of their effectiveness as VHTs and the respect held for them by the health system.

Further data collection using the VHT work motivation measurement scale with a larger sample size is warranted before firm claims regarding the validity of the three latent influences on VHT work motivation can be made. Claims regarding the construct validity of

the VHT work motivation measurement scale may have also been aided by access to activity data regarding VHT operations. Unfortunately, these data were not made available by the inSCALE project. This limitation is discussed in section 7.6.

4.6.3 Criterion validity of the VHT work motivation measurement scale

Predictions made regarding the performance of the VHT work motivation scores estimated based on the VHT work motivation measurement scale were not consistently realised. Predictions were assessed based on the results of checks for three forms of criterion validity, namely; predictive, concurrent and discriminant validity. Based on the results of these checks it was not possible to conclude whether the VHT work motivation scale did or did not have criterion validity. Beyond this finding, perhaps the most notable result from the checks for criterion validity were the consistently high VHT work motivation scores recorded when using the scale. Upon reflection there are several plausible explanations for these high scores.

It is possible that the wrong motivational domains were selected during scale development or that all dimensions of the construct of VHT work motivation were not accounted for. Commencing the measurement scale development process with domains largely developed for paid health workers may have been an error notwithstanding the strong theoretical premise for their inclusion and that they were supplemented by domains developed from formative research with VHTs. Indeed Clare Chandler cautioned against the non-critical adoption of scale items developed for use with paid workers such as those she developed with colleagues. She recommended they be reviewed for relevance to CHWs, pre-tested and adapted where necessary (Chandler, 2011). All of these recommended steps were taken as part of a rigorous measurement scale development process. As a result, as noted above, it was concluded that appropriate motivational domains were selected and the VHT work motivation measurement scale was likely to have content validity.

It is also possible that despite the development process undertaken, including the use of qualitative cognitive interviews, the structure and format of the questions confused VHTs. Given the results of the robust development process presented in this chapter, that aimed to produce well defined and carefully worded items that were relevant to VHTs and that were pre-tested and administered by well-trained field workers in accordance with best practice recommendations (Kanfer et al., 2012, Streiner and Norman, 2008), this possibility is perhaps less probable.

Potentially more plausible than the first two possible explanations is that VHTs are already highly motivated. Qualitative results from inSCALE's formative research (see Chapter 3) and associative interviews (see Chapter 6) provide additional evidence in support of this claim. If VHT's are already motivated yet their performance remains variable then a focus on motivation when attempting to improve VHT performance would appear to be misguided. At a minimum, a focus on the performance actions VHTs are motivated to take would appear to be a priority. It has been suggested that a focus on performance rather than motivation may be more appropriate given the challenges of interpreting the influence of latent variables such as work motivation (Rowe et al., 2005). The results here would appear to support this programmatic focus. It is worth noting too that other recent studies exploring health worker motivation (Mutale et al., 2013, Morrison et al., 2015), community health worker motivation (Vallières et al., 2016) and community health worker motivation in Uganda (Brunie et al., 2014, Mercader et al., 2014, Sanou et al., 2016) have also recorded notably high motivation scores. While similar questions regarding measurement scale sensitivity and the challenges of establishing criterion validity may have emerged but not been reported in these studies, these results appear to corroborate the suggestion that health workers and community health workers are often already motivated.

Reaching a firm conclusion that VHTs are highly motivated in their work must be tempered by the possibility that VHTs actually wished to appear motivated and that social desirability bias contaminated the results. It has been suggested that motivation should only be explored when working conditions such as appropriate supervision and supply of drugs have been controlled for (Perry et al., 2014). While these were controlled for in the design of the study, in practice they were not always in place (Källander et al., 2015b)[34]. This could potentially have led to the perception among VHTs that if they reported being motivated, drugs would be supplied and other benefits and rewards may be more forthcoming. Certainly the formative research results noted the durability of beliefs related to future payment for work (see Chapter 3 for the formative research results) (inSCALE, 2011a, inSCALE, 2011b). The potentially adverse influence of social desirability bias has been noted in other health worker (Mutale et al., 2013) and community health worker (Gopalan et al., 2012, Sanou et al., 2016) motivation studies.

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[34] Based on carer report of care seeking for their sick child with a VHT and specifically whether they were referred due to a lack of drugs or did not seek care due to the perception or awareness that there were no drugs.

There were additional, important limitations when it came to assessing the criterion validity of the VHT work motivation measurement scale. It was not possible to assess convergent validity, the most robust of the criterion validity measures (De Silva et al., 2006), as there was no available gold standard tool for assessing VHT work motivation available when the research took place. Had there been it would not have been possible to collect data using it for comparison anyway within the resource constraints of the inSCALE project (see Chapter 1 for an account of how the research reported here nested within the inSCALE project). In addition, assessments based on predictive and concurrent validity relied on theory based suggestions and formative research results rather than previously validated data from VHTs. This somewhat dilutes claims that the measurement scale has, or indeed has not, produced results indicative of work motivation for this population. Further studies with a larger sample are therefore required in order to examine the criterion based validity of the VHT work motivation measurement scale for assessing the work motivation of VHTs. It is notable that measuring VHT motivation accurately and with confidence, even with time and adequate resources, is a challenge.

4.6.4 Reliability of the VHT work motivation measurement scale

The VHT work motivation measurement scale was found to have reached an acceptable threshold of internal consistency (Bland and Altman, 1997). Test-retest reliability could not be assessed and future use of the measurement scale should consider making this assessment, as well as control for clustering and fieldworker effects, to bolster claims of reliability (Streiner and Norman, 2008, Haslam and McGarty, 2014).

4.6.5 Applicability of the VHT work motivation measurement scale to other settings and respondent groups

As noted above, further research to validate the VHT work motivation measurement scale and potentially replicate the findings of this study are recommended. The VHT work motivation measurement scale was developed based on a scale designed for use with paid health workers (Chandler et al., 2009). It was adapted to incorporate motivational domains appropriate for VHTs based on qualitative findings. This was important as the difference between motivational drivers of paid and unpaid workers is recognised in the literature (Glenton et al., 2010). VHTs are members of the community they work in and therefore subject to the same cultural and social influences as other community members. For

instance, their social standing and perceived status is likely to influence demand for their services (Kok et al., 2016). Contextual adaptation of the measurement scale is therefore required for volunteer respondent groups in other settings. This recommendation is consistent with those of other motivation scale development papers (Chandler et al., 2009, Ghimire et al., 2013).

4.7 Conclusion

The VHT work motivation measurement scale was developed in accordance with recommendations from the published accounts of the development of similar scales (Franco et al., 2004, De Silva et al., 2006, Chandler et al., 2009, Morrison et al., 2015). While the seventeen item measurement scale did not produce the predicted factor structure it did indicate alternative, latent influences on the construct of VHT work motivation; namely, *general motivation*, *retention in role* and *reward for effort*. The relevance of these factors for VHT work motivation has been indicated by qualitative findings from the formative research (Chapter 3) and associative interviews with VHTs to follow in Chapter 6. In combination with the robust process of measurement scale development, and findings that support the internal consistency of the scale and its comprehensibility and acceptability to VHT respondents, this would appear to indicate measurement scale validity. This conclusion is necessarily tempered by the consistently high scores recorded and the risk this could be indicative of a lack of scale sensitivity. Given the similarly high motivation scores recorded in comparable studies, the challenge of confidently estimating work motivation scores of community health workers has been noted. Further studies with a larger sample size are recommended to explore and potentially replicate the findings presented. Reflection on what measurement scales, ostensibly designed to capture VHT work motivation, are actually measuring should nevertheless be ongoing. This, final thought is developed in Chapter 7.

5. Development of a practical, reliable and valid VHT social identification measurement scale

5.1 Introduction

This chapter presents a social identification measurement scale designed to assess the degree to which volunteer village health team (VHT) members in Uganda identify with the VHT collective. As explored in the literature review (Chapter 2), heightened identification with a workers organisation, programme or work team generally leads to both increased motivation to improve performance and actual performance on specific work tasks (Ellemers et al., 1999, Haslam et al., 2000). Understanding whether workers identify with these social identities is therefore proposed to be important when exploring workplace motivation.

Measurement scales designed to measure the social identification of volunteer CHWs were not identified during the literature review (see Chapter 2). As a result, the need to adapt social identification scales implemented in other settings for use with Ugandan VHTs was recognised. The aim of this chapter is therefore to establish the extent to which the proposed VHT social identification scale actually measures VHT social identification with a specific VHT social identity. Like motivation, social identification is a latent construct. The challenges of designing a measurement scale to measure a latent construct have been explored in Chapter 4 including specific considerations related to reliability and validity.

Presented in this chapter are the steps taken in the adaptation and development of the VHT social identification measurement scale with a particular focus on assessments of validity and reliability. First the literature relating to measuring social identification is reviewed. This review concludes with the scale items that were selected for validity and reliability testing in the Ugandan research setting. The Methods, Results and Discussion sections of this chapter, in common with the approach in Chapter 4, are organised based on the validity and reliability measures undertaken. The chapter concludes with a comment on the potential for the measurement scale to be used to measure VHT social identification (i.e. its practicality) as well as its generalisability to other contexts and health worker groups.

5.2 Measuring the latent construct of social identification

A number of measurement scales have been developed to measure social identification. None have previously been used in a Ugandan context or with CHWs according to the results of the literature review (see Chapter 2). A common challenge faced by previous designers of social identification measurement scales has been that there are few clues in the social identity literature regarding the process of identification (Postmes et al., 2012). Where 'social identity' refers to a collective entity with specific features such as behavioural norms (Van Knippenberg and Sleebos, 2006, Leach et al., 2008, Postmes et al., 2012), 'social identification' refers to the individual's relationship with that social identity (Van Knippenberg and Sleebos, 2006, Postmes et al., 2012).

In seeking to specify the process of identification, and work towards development of a measurement scale, several scale developers have gone back to Henri Tajfel's original definition for guidance (Tajfel and Turner, 1979). Tajfel suggested that identification with a social group occurred due to 'the individual's knowledge that he (or she) belongs to certain groups together with some emotional and value significance to him (or her) of the group membership' (p.31. cited in Haslam 2004 p. 274). Doosje et al (1995) were the first scale developers to draw on Tajfel's definition when designing a social identification measurement scale, arguing that the process of social identification involves *cognitive*, *affective* and *evaluative* components and these should form dimensions of a measurement scale. Ellemers et al (1999) later specified these components as the individual's:

1. Self-categorisation as a group member (Ellemers et al., 1999). That is, a person's 'knowledge' that they 'belong' to a 'certain group' as per Tajfel's definition. This has been termed the *cognitive* component of social identification given it denotes a self-reflective process leading to the knowledge of group membership (Haslam, 2004).
2. Emotional commitment to the group (Ellemers et al., 1999). That is, the way a person feels about their self-categorisation as a group member. This has been termed the *affective* component of social identification as per Tajfel's definition (Haslam, 2004).
3. Perception of group based self-esteem (Ellemers et al., 1999). That is, a person's evaluation of the 'value' of the group with which they identify as per Tajfel's definition. This has been termed the *evaluative* component of social identification (Haslam, 2004).

Several social identification measurement scales have been developed that build on Ellemers et al's (1999) work (Jackson, 2002, Ashmore et al., 2004, Cameron, 2004, Roccas et al., 2008,

Leach et al., 2008). Among these, according to Postmes et al (2012), Leach et al's (2008) measurement scale is the 'most comprehensive attempt to develop a multi-component measure of identification to date' (p.3). It is examined briefly here.

Leach et al (2008) proposed a five component, two dimension[35] model of social identification (Leach et al., 2008). Leach et al's (2008) first dimension, termed *self-investment* was proposed to be comprised of *centrality* (degree to which group membership is seen as important to one's sense of self), *satisfaction* (how one feels about this group membership) and *solidarity* (sense of bonding and commitment to fellow group members). The second dimension, termed *self-definition* was proposed to be comprised of *self-stereotyping* (assessment of degree of similarity of oneself with other perceived group members) and *homogeneity* (assessment of similarity of all group members as a whole). Postmes et al (2012) argued that while social identification included Leach et al's *self-investment* dimension, the *self-definition* dimension was a precursor, in the case of the *self-stereotyping* component, or consequence, in the case of the *homogeneity* component, of social identification rather than indicative of it. In addition Postmes et al (2012) suggested that the three components of Leach et al's (2008) *self-investment* dimension offered only slight variations on the Tajfelian definition of social identification. That is, where Ellemers et al (1999) and Doosje et al (1995) had drawn *cognitive*, *affective* and *evaluative* components from Tajfel's definition of social identification, these had been recast with only minor modifications by Leach et al (2008) as *centrality*, *satisfaction* and *solidarity*.

Postmes et al (2012) advocate the use of Leach et al's (2008) multi-dimensional and multi-component social identification measurement scale when specific hypotheses related to the dimensions of social identification and their sub-components are made. When hypotheses instead relate to social identification as a homogenous construct, they suggest measurement scales be kept as simple and brief as possible. Furthermore, sub-categories of social identification have often been found to be highly correlated, and therefore seemingly indicative of a relatively homogenous underlying construct (Postmes et al., 2012).

Postmes et al (2012) propose a four item social identification measurement scale. Their scale is comprised of one item for each of the three components suggested by Tajfel in his original

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[35] As per Table 4.1, sub-categories of the latent constructs of work motivation (Chapter 4) and social identification are termed *dimensions* in this PhD. Leach et al (2008) proposed sub-categories of *dimensions* in their social identification measurement scale and termed them *components*.

definition of social identification (i.e. *cognitive*, *affective* and *evaluative social identification)* plus a fourth item proposed to be potentially sufficient as a stand-alone measure of social identification where space constraints prevent the inclusion of more items.

Table 5.1 contains Postmes et al's (2012) four item social identification measurement scale wording. Item 1 is the item proposed to be adequate as a measure of social identification when the number of scale items is limited (Postmes et al., 2012). For items 2, 3 and 4, the components of social identification they relate to according to Tajfel's definition of social identification (Tajfel and Turner, 1979) as interpreted and applied by Ellemers et al (1999) and Leach et al's (2008) *self-investment* dimension are provided.

Table 5.1: Postmes et al's (2012) social identification measurement scale wording and theoretical component

Item no.	Item wording	Component of Tajfel's social identification definition (Ellemers et al, 1999)	Component of Leach et al's (2008) self-investment dimension
1	I identify with [In-group]*	N/A	N/A
2	I feel committed to [In-group]	Evaluative	Solidarity
3	I am glad to be [In-group]	Affect	Satisfaction
4	Being [In-group] is an important part of how I see myself	Cognitive	Centrality

*Single measurement scale item proposed to be an adequate measure of social identification in certain conditions (Haslam, 2004, Leach et al., 2008, Postmes et al., 2012).

Postmes et al (2012) tested their four item measurement scale for correlation against their single item measure of social identification (i.e. item one of the four item scale – i.e. item 1 in Table 5.1) as well as against Leach et al's (2008) *self-investment* components together and by each contributing component (i.e. *centrality*, *satisfaction* and *solidarity*). Table 5.2 contains the results of Postmes et al's (2012) analysis based on data gathered from 265 Dutch undergraduate psychology students. It indicates strong, positive correlation not only between the four item measure and Leach et al's (2008) *self-investment* dimension but also between Postmes et al's (2012) four item and single item measures. This provides reassurance regarding the validity of the measurement scale for measuring the construct of social identification.

As Postmes et al's (2012) four scale items draw on the sub-components of social identification articulated in Tajfel's original definition (Tajfel and Turner, 1979), they provide evidence based reassurance that the contributing elements of the construct have been included, namely; *cognitive*, *evaluative* and *affective* social identification (Doosje et al., 1995, Ellemers et al., 1999, Van Knippenberg and Sleebos, 2006, Leach et al., 2008). In addition, this short scale satisfies the need for brevity emphasised by inSCALE project partners (see Chapter 1). Based on this, Postmes et al's (2012) four item social identification measurement scale was selected as the scale to be adapted for the measurement VHT social identification.

Table 5.2: Correlations between different measures and components of social identification

		Postmes et al (2012)		Leach et al (2008)			
		1. Single item	2. four items	3. Self-Investment (10 items)	4. Centrality (3 items)	5. Solidarity (3 items)	6. Satisfaction (4 items)
Postmes et al (2012)	1. Single item	1.00					
	2. Four items	0.84	1.00				
Leach et al (2008)	3. Self-Investment (10 items)	0.76	0.96	1.00			
	4. Centrality (3 items)	0.71	0.84	0.87	1.00		
	5. Solidarity (3 items)	0.66	0.87	0.90	0.67	1.00	
	6. Satisfaction (4 items)	0.66	0.84	0.90	0.63	0.76	1.00

NB: Correlations were computed across two aggregated datasets of Dutch undergraduate students: Postmes et al (Postmes et al., 2012) Study 1 and Jans et al (Jans et al., 2011) Study 3, total N=430 (Postmes et al., 2012).

As noted above, the four social identification items includes the single item proposed as potentially adequate as a standalone measure of social identification by Postmes et al (2012) (i.e. item 1 in Table 5.1). This Chapter includes an assessment of whether scores generated from the single item are a reliable and potentially valid indicator of social identification when compared to those generated by the four item social identification measurement scale.

5.2.1 First draft composition of the Ugandan VHT social identification measurement scale

When developing the VHT social identification measurement scale the particular social identity being explored needed to be added to the wording. As previously noted (in Chapter 1), in Uganda, the Ministry of Health VHT strategy proposes that teams of five VHTs should operate in each village (MoH_Uganda, 2010a). Both these teams and the individuals within them are referred to colloquially as 'VHTs' (inSCALE, 2011a, inSCALE, 2011b). Two VHTs per village receive additional training in iCCM of childhood illnesses on top of their 'basic training package' of health prevention messaging (MoH_Uganda, 2010a). The focus of the inSCALE interventions (see Chapter 3), in terms of improved performance, was on those VHTs trained in iCCM. These were the respondents who completed the VHT social identification measurement scale.

Formative research with VHTs trained in iCCM indicated they have an awareness of different VHT categories such as the type of training they and other VHTs had received or their village location (inSCALE, 2011a, inSCALE, 2011b). While targeting VHTs trained in iCCM, the interventions referred to 'VHT/s' and did not specify between those trained in iCCM and those who comprise a local village VHT unit (see Chapter 3). Depending upon how the term 'VHT/s' was interpreted by individual VHTs, it is possible that the interventions promoted identification with any or all of these VHT collectives.

An additional consideration was that the literature suggests different attitudinal and behavioural consequences based on whether individuals self-identify as members of a large collective or a sub unit of that collective (Van Knippenberg and Schie, 2000, Ellemers et al., 2003, Van Knippenberg and Sleebos, 2006). Studies of organisational identification argue that identification with a work group[36] can potentially lead to higher status, greater retention rates, job satisfaction and work motivation than identification with the organisation as a whole (Ashforth and Mael, 1989, Van Knippenberg and Schie, 2000, Haslam et al., 2000, Ellemers et al., 2004). These studies stress that it is a matter of degree though, and that organisational identification can also have these effects. These results have led to an increased focus on building the identity of teams within organisations or 'work groups' (Van Knippenberg and Schie, 2000).

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[36] That is, a smaller, work based collective than the organisation as a whole.

With this evidence from the literature regarding 'work groups' in mind, it was considered important to differentiate between larger and smaller VHT collectives with which VHTs may identify in the VHT social identification measurement scale items. The social identification scale (Table 5.1) was, as a result, adapted for three potential VHT identities. These were; all VHTs or VHT programme VHTs, iCCM trained VHTs and the local village VHT. This approach to social identification measurement scale design has a precedent. Van Knippenberg and Van Schie (2000) utilised Mael and Ashforth's (1992) unidimensional measurement scale of social identification[37] to measure identification with the organisation as well as with a smaller work group within the organisation. They simply changed the wording of items to indicate the target of identification; either the organisations name or 'my work group' (Mael and Ashforth, 1992). This was the approach adopted when adapting the first draft of the VHT social identification measurement scale. The result was twelve items divided into three discrete four item measurement scales, one each for the three proposed VHT social identities – see Table 5.3.

Table 5.3: VHT social identification measurement scale items for each of three potential VHT identities

VHT identity	Item no.	Adapted item wording
VHT programme identity	1	I identify with the VHT programme
	2	I feel committed to the VHT programme
	3	I am glad to be a VHT
	4	Being a VHT is an important part of how I see myself
iCCM trained VHT identity	5	I identify with iCCM trained VHTs
	6	I feel committed to iCCM trained VHTs
	7	I am glad to be an iCCM trained VHT
	8	Being an iCCM trained VHT is an important part of how I see myself
Local VHT identity	9	I identify with my local VHT
	10	I feel committed to my local VHT
	11	I am glad to be a local VHT
	12	Being a local VHT is an important part of how I see myself

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[37] Mael and Ashforth's social identification measurement scale contains six items and has a high inter item correlation with Cronbach's alpha of reportedly greater than .80 (Mael and Ashforth, 1992). While a popular measurement scale in organisational settings, it has been criticised on the grounds that it only partially measures the social identification construct due to its focus on *affective* aspects while excluding the *cognitive* aspects of identification (Haslam, 2004). This is why it was not considered for measuring VHT social identification.

The next section presents the methods through which the VHT social identification measurement scale was tested for reliability and validity.

5.3 Methods

This section describes the specific methods used to assess and improve the validity and reliability of the VHT social identification measurement scale. Table 5.4 summarises the aims and methods for each of the scale design components addressed; namely, content, construct and criterion validity and reliability. The Methods section, as well as the Results and Discussion sections that follow, are all structured according to these design components. Definitions of validity and reliability have been discussed in Chapter 4 (section 4.3).

In common with the VHT work motivation measurement scale, the VHT social identification measurement scale used Likert scale items and images proposed to assist respondents when choosing between response categories. The rationale for using Likert scale items and images is discussed in the Methods section of Chapter 4.

As the methods used were the same as those adopted for the validation of the VHT work motivation measurement scale (see Chapter 4), only specific methodological differences for the adaptation and development of the VHT social identification measurement scale are highlighted in this Methods section.

Table 5.4: Summary of VHT social identification measurement scale design aims and methods

Scale design component			Aim	Method *[NB: Methods conducted pre-survey data collection with VHTs shaded ==yellow==, methods conducted post-data collection shaded ==green==]*
Type of Validity	Content		1. Conceptual clarity: define VHT social identification	Literature review: focus on measuring social identification
			2. Include manifest indicators of the key components that contribute to VHT social identification	1. Literature review: focus on domains of social identification 2. Review of the inSCALE project's formative research with Ugandan VHTs to assess which VHT identity is most salient for VHTs
			3. Design or adapt an appropriately structured and worded scale in terms of language and culture	1. Literature review: lessons from similar settings 2. Formative research: lessons from the research setting
	Construct		1. Assess whether manifest indicators are interpreted as intended and are meaningful to VHTs 2. Determine acceptability of scale format for VHTs	Qualitative 'cognitive' interviews with Ugandan VHTs to understand interpretations of key words, concepts and scale items, and acceptability of the survey structure
			3. Assess the degree to which data captured by the manifest indicators are indicative of VHT social identification with different social identities	1. Assess whether a single item is sufficient for calculating social identification, consider missing data, items highly correlated with others and whose score directionality, assessed through a by sort analysis, was not supported by evidence from the formative research 2. Assess predicted factor structure: exploratory factor analysis 3. Assessment of internal scale consistency: calculation of Cronbach's alpha 4. Generate VHT social identification scores
	Criterion		1. Predictive validity: scale discerns scoring patterns it should	VHT work motivation scores analysed for relationship with variables considered predictive of performance: correlation coefficients Variables selected based on literature review (see chapter 2) and formative research (see chapter 3)
			2. Concurrent validity: scale discerns between respondents that should produce different scores	Mean VHT social identification scores analysed for difference in inSCALE intervention areas: independent samples t-tests
			3. Discriminant validity: confirm lack of association between scores of different measure components	Exploratory factor analysis to examine whether VHTs identify with discrete, VHT social identities
Reliability			Assess the degree of measurement error of the VHT social identification scale	1. Assessment of internal scale consistency: calculation of Cronbach's alpha 2. Check clustering and fieldworker effects: ANOVA of social identification scores by sub-county and fieldworker

5.3.1 Content validity: drawing on reviewed literature and formative research

In order to increase the likelihood of including the most valid scale content, decisions regarding the inclusion of scale items and their wording was made based on theoretical literature (see Chapter 2), previous social identification scales developed for other contexts and formative research with Ugandan VHTs (see Chapter 3). The following specific methods were employed:

1. Literature review
2. Review of the inSCALE project's formative research with Ugandan VHTs (see Chapter 3)

While the literature review and review of formative research were fully described in Chapters 2 and 3 respectively, each method is briefly explained again below.

Literature review

The literature was searched to assess whether all dimensions of VHT social identification were being measured and if an appropriate, pre-existing measurement scale was available. Details of the specific methods used in the literature review have been outlined in Chapter 2. These details concern the date ranges of searches, key words used and databases searched. The particular focus of the literature review for the development of the VHT social identification measurement scale was on social identity and identification theory, experiences from applied strategies and previous attempts at the construction of social identification scales. The development of the VHT social identification measurement scale drew on the accumulated experience of this earlier work. Specifically it sought to determine whether social identification of Ugandan VHTs with the VHT collective should be considered a homogenous or multi-dimensional construct and to develop a rationale for why each scale item was included in the first version of the measurement scale.

The results of the literature review as they relate to the development of the VHT social identification measurement scale have been presented earlier in this chapter.

Review of inSCALE formative research

The results of the inSCALE project's formative research provided a ready source of contextually appropriate data with which to assess the applicability of previously developed social identification measurement sales. The VHT social identification scale adaptation and development process specifically drew on the inSCALE project's formative research results

in order to establish which VHT identities were meaningful for VHTs and to specify which VHT collective (i.e. VHT programme, iCCM trained or local – see Table 5.3) the scale would focus on. The initial wording of the measurement scale items presented in Table 5.3 reflect these data. Interviews with VHTs were next conducted in order to assess whether this wording was meaningful to VHTs and understood by them as intended. The methods used are described in the next section related to construct validity.

5.3.2 Construct validity: drawing on cognitive interviews and statistical tests

In order to maximise the construct validity of the VHT social identification measurement scale it was important to assess the degree to which included scale items actually measured social identification with the specified social identity. Two key aspects were explored. The first was whether the items held the same meaning for VHT respondents as they did for the scale designers. The second was to assess whether the data captured actually contributed to distinct constructs; namely the different identities explored. The following specific methods were employed to address these key aspects:

1. Cognitive interviews with VHTs
2. Exploratory factor analysis and measures of internal consistency towards developing the most valid VHT social identification score

Each method is explained here but only in terms of how they differed from the approach taken to the development and validation of the VHT work motivation measurement scale reported in Chapter 4.

Cognitive interviews with VHTs to assess understanding and appropriateness of measurement scale

The 'cognitive interviewing' approach was used in Uganda with VHTs to understand whether the wording, concepts and mode of questioning in the measurement scale were understood by the target respondents as intended by the scale designers. The interviews were conducted in the same research encounter as the qualitative interviews described in the content validity section above. The sampling approach, pre-testing, interview topic guide development, training of fieldworkers and the key word glossary, as well as the specific approach to the collection and analysis of data were as described in Chapter 4.

At the time of the interviews the social identification measurement scale consisted of three batteries of four social identification items; one for each of three social identities (see Table 5.3). As the wording of the items varied between the batteries only in terms of the identity referred to, each battery was not explored in full with the respondents. Instead the first item of each battery and the first battery in full was explored. This meant respondent understanding of the wording used to specify the three distinct identities was probed as well as the wording of the four items. The topic guide for the interviews can be found in Appendix 9.8.

The results of the cognitive interview process are presented in the Results section. The end product of this process was a list of VHT social identification scale items in a format acceptable to and understood by VHTs. These scale items were incorporated into the inSCALE VHT endline survey. The next, Methods section explains how the tests performed on the data collected using the social identification scale items led to identification of the most valid means of estimating VHT social identification with the VHT collective.

Assessment of scale item contribution to the measurement of VHT social identification leading to estimation of VHT social identification scores

Data were collected during the inSCALE project endline survey which took place in April and June 2014 in Western Uganda as described in detail in Chapter 4 (not repeated here). Tests for variables with missing data, variables with more than 80% of responses recorded in the same response category, highly correlated variables and directionality of scoring followed the same approach outlined in Chapter 4. Items were reviewed based on these data for whether they would be included in the final measurement scale.

Cronbach's alpha tests were run on all remaining variables for each social identity to determine internal consistency of each scale. This contributed to an understanding of both validity and reliability. The method used was the same as that used when developing the VHT work motivation measurement scale (see Chapter 4).

Establishing the most valid scale item composition for estimating VHT social identification

The composition of the social identification measurement scale pre-qualitative work was a battery of four items for each of three different identities; VHT national programme, iCCM trained VHT and local VHT (see Table 5.3). Based on the qualitative results this changed to a battery of six items for each of two retained but re-worded identities; VHT programme and

[INSERT VILLAGE NAME] VHT. Six items were required in each social identification battery as the data analysis revealed that there were three plausible options for the first item (see Table 5.7). The data and decision making process leading to these changes, are presented in the Results section.

In the review of previous social identification measurement scales presented at the start of this Chapter, the suggestion by Postmes et al (2012) was introduced that a single, as opposed to four, item measure of social identification may be sufficient. Producing both a single and a four item VHT social identification measurement scale was therefore the aim. Given the three different, first item options generated from the qualitative results, exploratory factor analysis was used to determine which was most appropriate to include in each battery of social identification measurement scale items. Exploratory factor analysis was also used to establish whether respondents' scores indicated that they actually differentiated between social identification with the different identities explored in each of these item batteries and to generate social identification scores.

Confirmatory factor analysis was not used as social identification measurement scales had never previously been used with this population. This led to less certainty when predicting the underlying dimensions or factors influencing this overarching, latent construct (Borghi et al., 2017).

In order to determine which of the three first item options to use, an exploratory factor analysis was run from the polychoric correlation matrix. At the same time a scree test to generate eigenvalues was run in order to determine the optimum number of factors to include. An eigenvalue of 1 or greater was used as the cut-off for inclusion in observance of the convention known as the 'Kaiser criterion' (Hayton et al., 2004, Borghi et al., 2017). Factor loadings were examined to determine whether items loaded onto a single factor and if so, to what degree (i.e. whether the loading was greater than .4 as per the cut off for inclusion similarly used during the development of the VHT work motivation measurement scale presented in Chapter 4), and which of the three options for the first item provided the best 'fit', as indicated by relative loading, to the factor (Chandler et al., 2009).

Determining whether VHT respondents identify with two, distinct VHT identities
After establishing the optimum four item combination for each social identification scale, the batteries of social identification scale items were tested to assess whether they actually measured different identifications. An exploratory factor analysis was once again run from

the polychoric correlation matrix proposing a factor for each of the remaining social identities. The approach adopted was the same as for previous analyses exploring the difference between organisational and work group social identification (Van Knippenberg and Schie, 2000).

Estimating VHT social identification scores

After determining the items to include in the social identification scale item batteries, scores were estimated. The estimates were made by summing the scores provided by each respondent for the scale items. Items were reverse coded where necessary so that a higher score indicated greater identification. This approach was consistent with that taken by previous social identification scale developers (Haslam, 2004, Leach et al., 2008, Postmes et al., 2012). Scores were not weighted as there was no *a priori* reason for hypothesising a greater or lesser influence of any of the scale items.

5.3.3 Criterion validity: testing scale performance against predictions

In common with the development of the VHT work motivation measurement scale, three types of criterion validity were considered in this study; predictive, concurrent, and discriminant validity. It was not possible to explore 'convergent validity' by comparing scores from the same population on the VHT social identification measurement scale and an alternative, 'gold standard' social identification measurement scale as the VHT social identification measurement scale was considered the best available option.

Predictive, concurrent and discriminant validity

VHT social identification scores were tested for score variations influenced by variables selected from the literature review (see Chapter 2) and formative research results (see Chapter 3). It was predicted that mean VHT social identification scores would:

1. Increase as perceived status and respect, job satisfaction and work motivation increase and as intention to leave the VHT programme decreased (predictive validity).
2. Be higher in the two inSCALE intervention areas when compared to mean VHT social identification scores in the control area (concurrent validity).
3. Be discernible for discrete social identities (discriminant validity).

The theoretically and empirically supported premise was that the more an individual conceives of themselves in terms of group membership (i.e. social identification), the more they tend to adopt the attitudes and behavioural norms they perceive to be typical of the

group with which they identify (Turner et al., 1987, Van Knippenberg and Schie, 2000, Haslam, 2004, Turner and Reynolds, 2010). As they adopt these typical attitudes and behaviours, their sense of belonging with the group increases, and the cycle continues. The variables predicted to co-vary with identification; status and respect, job satisfaction and work motivation, are typical of this process. For those who identify less with the collective, seeking to move on is a more attractive option. For this reason, intention to leave was proposed to have a negative linear relationship with social identification. Assessments of whether discrete social identities were discernible were made utilising exploratory factor analysis (see previous section).

Table 5.5 contains a description of how the comparison variables used were calculated. Correlations and variation in mean scores between social identification and key variables using t-tests were calculated and examined. These are commonly utilised approaches in social identification measurement scale development (Leach et al., 2008, Postmes et al., 2012).

Table 5.5: Comparison variables for assessing VHT social identification measurement scale criterion validity

Variable[a]	How calculated	Results Table
VHT status and respect	VHT self-report measure of whether they strongly agree, agree, feel neutral, disagree or strongly agree that: 1. I am respected in the community for the work I do in the community	5.12
VHT job satisfaction	VHT self-report measure of whether they strongly agree, agree, feel neutral, disagree or strongly agree that: 1. In general I am satisfied with my role as a VHT 2. I think the work I am asked to do is worth the time I spend on it	
VHT work motivation	Scores generated from the VHT work motivation measurement scale (see Chapter 4). A seventeen item scale used to generate scores for each VHT based on data driven weights for each variable specified through factor analysis	
VHT intention to leave	VHT self-report measure of whether they strongly agree, agree, feel neutral, disagree or strongly agree that: 1. I intend to stop working as a VHT 2. I expect to stay working as a VHT	
inSCALE intervention areas	The intervention arm of the surveyed VHT (control, technology or community arm)	5.13

[a] Captured from VHT interviews conducted during the inSCALE project endline evaluation by fieldworkers who entered and cross-checked the data

5.3.4 Reliability: assessing internal scale consistency

The reliability of the data produced by the VHT social identification measurement scale was assessed in the same two ways as the VHT work motivation measurement scale presented in Chapter 4.

Calculation of the Cronbach's alpha of the combined VHT social identification measurement scale items was made in order to provide an indication that the combined scale items contribute to the single latent construct of VHT social identification (Streiner and Norman, 2008).

As with the VHT work motivation measurement scale it was also important to assess whether social identification scores were influenced by the cluster randomised control design (Källander et al., 2015a) and variations between fieldworkers who collected the data. As the sampling of VHTs was the same as for the VHT work motivation measurement scale presented in Chapter 4, intraclass correlation coefficients were calculated using analysis of variance (ANOVA) (Streiner and Norman, 2008, Kul et al., 2014). Variations in mean VHT social identification were examined in the same way for the influence of the fieldworker who collected the data. The results provide an indication of whether sub-county and fieldworkers need to be controlled for when examining variations in mean VHT social identification scores by variables of interest such as intervention area.

5.4 Results

5.4.1 Content validity: assessing whether the right scale items have been included in an appropriate format

The aim when improving the content validity of a measurement scale is to seek the most valid scale content (Mokkink et al., 2010, Streiner and Norman, 2008). The selection of the VHT social identification measurement scale items drew on previous theoretical and applied work including formative research with Ugandan VHTs. The results have been presented at the start of this chapter.

5.4.2 Construct validity 1: assessing the appropriateness and acceptability of scale format and retaining, editing or excluding items based on VHT respondent understanding

In this section the results of the analysis of cognitive interviews with VHTs are presented. These data were used to assess the appropriateness of the format of the VHT social identification measurement scale, VHT perceptions regarding different VHT identities and whether VHTs understood scale items as intended. This contributes to appraisal of the measurement scale's construct validity.

Appropriateness and acceptability of measurement scale format

The format of the Likert scale items used, their prompts and the use of images as a respondent aid have all been explained in Chapter 4. These elements were the same for the VHT social identification measurement scale items and the VHT work motivation measurement scale items.

Distinguishing between VHT identities

It was important to establish whether the language used to describe the different VHT identities and their differentiation were meaningful to VHTs. While reference to the larger collective of VHTs most commonly involved using the term 'VHTs', the data revealed that there was little consistency in the terms used by VHTs to distinguish different VHT types. Commonly descriptions instead of terms were used.

> 'the person who treats people in the community' [I16. Female P. 7]
>
> 'doctors of children or kid's doctors' [I13. Male P. 11]
>
> 'the one who give out drugs for the children' [I22. Female P. 6].
>
> 'I introduce myself as a VHT, my names and my community' [I17. Male P. 8].

The scale items used the term 'local VHT' to refer to the members of a single village's VHT. This reference was not widely understood. No respondents volunteered terms such as 'local VHT' or 'community VHT'. Descriptions of VHTs based on the body financially supporting them or their disease focus were more common. These descriptions were seemingly clear to VHTs.

> 'Some VHTs trained by PACE'[38] [I16. Female P. 7]

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[38] PACE is the Ugandan affiliate organization of Population Services International or PSI (http://psi.org/uganda accessed 26th March, 2014).

'Those of Red Cross and HIV VHTs' [I1. Female P. 9].

Based on the tendency to refer to VHTs with a contextual identifier, the decision was taken to refer to the local VHT by its village name. That is, '[INSERT VILLAGE NAME] VHT'. Many VHTs suggested this description was already used when seeking a way to distinguish VHTs from different communities.

'I refer them by their names and the name of the village they come from'

[I12. Male P. 9]

Ensuring village names were added appropriately to the scale became a key focus of fieldworker training ahead of survey data collection. This directive to the fieldworkers was incorporated into their training in addition to the other emphases outlined in Chapter 4.

The distinction between VHTs with basic training and those who have additional training in iCCM was poorly described by respondents. Indeed for many the distinction was nonsensical given there were often only VHTs with iCCM training in their village[39].

'This question is irrelevant because in the village there are only iCCM trained VHTs …

I don't see any difference because we are doing the same job' [I5. Male P. 4]

For this reason the distinction between iCCM and non-iCCM trained VHTs was dropped from the measurement scale incorporated into the inSCALE endline evaluation survey. Instead the distinction was made between the overall VHT programme in comparison with the local VHT as indicated by the '[insert village name] VHT'. Items 5-8 in Table 5.3 were dropped. The finding described here that led to these items being dropped was captured at the same time as the cognitive interviews. As a result, iCCM trained VHT identity was still assessed when implementing the cognitive interview method.

Retaining, editing or excluding items based on respondent understanding

The results of the analysis of cognitive interviews with VHTs are presented in this section. This analysis led to the determination of the final item wording of the VHT social identification items incorporated into the inSCALE endline VHT measurement scale.

Twelve VHT social identification measurement scale items, comprised of three batteries of four, one battery for each proposed VHT identity, were proposed following the scale

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[39] Despite the Ugandan Ministry of Health's policy that there be a team of five VHTs in each village and that two of them be trained in iCCM (Ugandan MoH, 2010), this was not always found to be the case (inSCALE, 2011).

development phase (see Table 5.3). The wording in each battery was the same for each item except for the identity referred to. As a result, as noted in the Methods section, it was not necessary to explore all twelve items with VHTs during the cognitive interviews. Table 5.6 shows the six items that were explored qualitatively during 'cognitive interviews'. They comprise the four items for identification with the VHT programme social identity and the first item for the other two batteries. The decision to exclude items referring to iCCM trained VHTs was taken after these data were collected as noted above.

Table 5.6: Social identification measurement scale items explored during VHT cognitive interviews

No.	Item wording
1	I identify with the VHT programme
2	I feel committed to the VHT programme
3	I am glad to be a VHT
4	Being a VHT is an important part of how I see myself
5	I identify with iCCM trained VHTs
6	I identify with my local VHT

NB: Items shaded yellow relate to VHT programme social identification
NB: Items shaded green are the first scale items for 'iCCM trained' and 'local' VHT social identification

Of the six social identification scale items explored during the cognitive interviews, one was excluded (item 5 in Table 5.6) and three were altered (items 1, 4 and 6). Item 5 was excluded on the basis that the iCCM VHT identity was not meaningful to respondents. Items were altered based on their wording rather than the named identity. For items 1 and 6, two alternative items were developed for the VHT social identification scale based on data that suggested the wording of the original item was ambiguous to VHT respondents.

The results from the cognitive interviews for each of the items are presented in Table 5.7 below alongside a discussion of the rationale for item exclusion or alteration. These results also draw on the focus group discussion held with fieldworkers. The two items respondents either understood as intended, or sufficiently to allow the conclusion that alterations or exclusions were not warranted, are not discussed further and have been retained in the final version of the measurement scale as designed (i.e. items 2 and 3 in Table 5.6).

Table 5.7: Cognitive interview results for altered and excluded VHT social identification measurement scale items

Item wording prior to cognitive interviews (Item no.)	Results from cognitive interviews with VHTs and rationale for item alteration or exclusion	Item wording post cognitive interviews
I identify with the VHT programme (Item 1 Table 5.6)	Half of the VHT respondents understood the item as intended. *'It means that you are among the VHTs or one of the VHTs or identified to be one of the VHTs … It means you are known as a VHT.' [I2. Male P. 9]* It nevertheless posed problems for the remaining 50%. The main challenge was with the word 'identify' with VHT respondents offering a variety of interpretations of the meaning including being known in the community, to talk to, to behave well or cooperation and working together. *'It means I have a good working relationship with my fellow VHTs or understanding with my fellow VHTs.' [I8. Female P. 10]* Fieldworkers too struggled with the meaning of identify. *'On the issue of identity even during the training we failed to agree.' [FW discussion, P. 19]* One suggested alternative wording from VHTs was to use the word 'relate' instead of 'identify'. For this respondent, a change to 'relate' brought an understanding of the item more in keeping with what was intended. When the item included 'identify,' they understood it to mean: *'It means you are cooperating with the VHTs.' [I14. Female P. 6]* When 'relate' was used instead of identify they understood the item to mean: *'That is (to) have a connection in terms of being together.' [I14. Female P. 6]* The fieldworkers on the other hand argued that 'relate' was more inclusive than 'identify' which implied a smaller group. *'that is why we are finding problems with relating because we relate with everybody even those who are passing by.' [FW5. Female P. 19]* There was mixed support for both the original wording and the proposed alternative of 'relate'. Email correspondence with Professor Alex Haslam[40] where the dilemma was outlined led to the conclusion	A. I identify with the VHT programme B. I relate to the VHT programme C. I feel connected to the VHT programme

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[40] Alex Haslam is a Professor of Social Psychology currently located at the University of Queensland. Professor Haslam has published extensively on the subject of work motivation and social identity (e.g. Haslam et al., 2000, Haslam, 2004).

	that the original wording should be retained but analysed in comparison with the VHT and fieldworker preferred wording 'I relate' along with Alex Haslam's preferred alternative of 'I feel connected to' (Haslam, 2011).	
Being a VHT is an important part of how I see myself (Item 4 Table 5.6)	The explanations provided for the meaning of this item were in general fairly convoluted. There are subjective value judgement (i.e. 'important') and self-reflection (i.e. 'part of how I see myself') elements of the item that seemingly complicate interpretation. The word 'important' was often interpreted as inviting a judgement as to whether the role itself was important and whether that translated into a positive view of themselves. Such an interpretation runs the risk of a respondent for example who does not see the role as important, but nevertheless sees themselves very much as a VHT, answering in the negative when a positive response would be more truly indicative of their views. *'I see myself happy that I am important to my community' [I1. Female P. 11]* Very few respondents were able to explain the link between the VHT role and how they saw themselves. Over half of the respondents did however demonstrate their understanding of the item. Those that did understand typically were able to reflect on what being a VHT meant to them and how this had impacted positively on their view of themselves. *'That is in relation to the value one has gained over time … it is like the way you feel about yourself, the more value one has got' [I20. Female P. 17]* *'This means to be a VHT makes me to feel important as myself' [I12. Male P. 10]* Overall it would seem that an alternative that avoids the self-reflection element, and the use of the word 'important' with its potential to encourage a response based on perception of importance of the VHT role generally instead of to the respondent, needed to be developed. 'Being a VHT is a big part of who I am as a person' was the alternative wording developed in light of these results.	Being a VHT is a big part of who I am as a person
I identify with iCCM trained VHTs (Item 5 Table 5.6)	Earlier analyses have indicated that the use of the word 'identify' is problematic and therefore alternatives need to be established (see item 24 above). In addition 'iCCM trained VHTs' is seemingly not a distinctive and meaningful category to VHTs (see section 1 of Chapter 6). This item and the whole battery of items referring to 'iCCM trained VHTs' were, as a result, excluded.	N/A - excluded

I identify with my local VHT (Item 6 Table 5.6)	The decision to adopt two alternative item wordings as well as the original for the first of the four social identification items is described for item 24 above. The decision to change the reference from 'my local VHT' to 'the [insert village name] VHT' is described in the section above relating to 'distinguishing between VHT identities'. The item wording adopted is therefore the same as for item 24 with the only difference being 'the [insert village name] VHT' social identity being referred to. It was stressed to fieldworkers during their training ahead of the inSCALE endline evaluation in Uganda that they make a note of the name of the respondent VHT's village ahead of administering the VHT social identification measurement scale items in order to ensure the correct village name was inserted into the item statement wording.	A. I identify with the [insert village name] VHT B. I feel connected to the [insert village name] VHT C. I relate to the [insert village name] VHT

Table 5.8 contains the final wording of the twelve items included in the inSCALE VHT social identification measurement scale incorporated into the inSCALE VHT endline survey. Items 1-6 relate to VHT programme social identification and items 7-12 to the local village social identification. The first three items in each battery of six items (i.e. items 1-3 and items 7-9) are three different first item options. These incorporate the word 'identify' in the first instance, the alternative suggested by the fieldworkers, 'relate', in the second, and the alternative suggested by Alex Haslam, 'connected' (Haslam, 2011), in the third. Once the best performing option of the three first items is selected, each social identity will have four scale items. Social identification scores will therefore be generated from variable scores from four items for each form of social identification.

Table 5.8: VHT social identification measurement scale item wording for the inSCALE endline VHT survey

Item no.	VHT social identification measurement scale items	Variable name
1	I identify with the VHT programme	FIDENTG
2	I relate to the VHT programme	FRELATG
3	I feel connected to the VHT programme	FCONNG
4	I feel committed to the VHT programme	FCOMMG
5	I am glad to be a VHT	FGLADG
6	Being a VHT is a big part of who I am as a person	FDEFING
7	I identify with the [insert village name] VHT	FIDENTL
8	I relate to the [insert village name] VHT	FRELATL
9	I feel connected to the [insert village name] VHT	FCONNL
10	I feel committed to the [insert village name] VHT	FCOMML
11	I am glad to be a [insert village name] VHT	FGLADL
12	Being a [insert village name] VHT is a big part of who I am as a person	FDEFINL

NB: Items shaded yellow relate to VHT programme social identification
NB: Items shaded green relate to 'local' VHT social identification as indicated by the name of the village of the VHT respondent

5.4.3 Construct validity 2: assessing scale item contribution to VHT social identification leading to estimation of VHT social identification scores

This section draws on survey data from the inSCALE endline evaluation in Uganda and conventionally used scale development statistical tests to examine whether the VHT social identification measurement scale has construct validity. That is, whether scale items

produced scores that contribute to an understanding of VHT social identification. These tests were also used to determine the optimum first item option. The specific methods used can be found in the Methods section.

The VHT social identification measurement scale followed the VHT work motivation measurement scale in the VHT inSCALE endline survey. Detailed information regarding the VHT sample can be found in Chapter 4 and is not repeated here.

Optimum VHT social identification measurement scale item composition based on survey data

No social identification items recorded responses of >80% in any of the response categories. A bysort analysis revealed that all items scored in the direction predicted. The results of these analyses indicate that no items need to be removed.

A polychoric factor analysis proposing four factors (one for each item) and a scree test was run on each of the three different four item combinations of each of the two social identification scale batteries[41]. For each of the six combinations of items it was clear that there was a single factor with, in all cases, the second factor eigenvalue being well below one. The factor loadings for the different first item options for both social identification measurement scales, the eigenvalues, and the Cronbach's alpha coefficients for each of the four item combinations are presented in Table 5.9.

Table 5.9: First item options for the two, four item social identification measurement scales

Social identification battery	First item options: variable name and item wording	Eigenvalues for 4 item battery with specified first item (proposing 4 factors)	Factor loading	Cronbach's alpha for 4 item battery with specified first item
VHT Programme	FIDENTG: I **identify with** the VHT programme	Factor 1: 2.15 Factor 2: .08	Item loads on Factor 1 at .71. The remaining three at >.7	.69

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[41] As noted in Chapter 4, when running exploratory FA in Stata it is necessary to nominate a number of anticipated factors. In this instance, four factors were proposed (one for each item) to determine whether any had a discrete influence on social identification or instead contributed to a single, homogenous construct.

Social Identification	FCONNG: I **feel connected to** the VHT programme	Factor 1: 1.91 Factor 2: .13	Item loads on Factor 1 at .52. The remaining three at >.7	.57
	FRELATG: I **relate to** the VHT programme	Factor 1: 1.93 Factor 2: .12	Item loads on Factor 1 at.54. The remaining three at >.7	.59
[Insert village name] VHT Social Identification	FIDENTL: I **identify with** the [insert village name] VHT	Factor 1: 2.71 Factor 2: .12	Item loads on Factor 1 at .92. The remaining three at >.7	.77
	FCONNL: I **feel connected to** the [insert village name] VHT	Factor 1: 2.64 Factor 2: .123	Item loads on Factor 1 at .89. The remaining three at >.7	.77
	FRELATL: I **relate to** the [insert village name] VHT	Factor 1: 2.48 Factor 2: .14	Item loads on Factor 1 at .8. The remaining three at >.7	.74

For the VHT programme social identification measurement scale battery, the original first item wording (i.e. 'I identify with the VHT programme') loaded on the first factor at greater than .7. This was a higher factor loading than either of the two alternative first item options which loaded at .522 ('I feel connected to the VHT programme') and .54 ('I relate to the VHT programme') respectively. The four item combination incorporating the original wording of the first item was also the only one of the three combinations to return a Cronbach's alpha score of ≥.7 (.686), the conventional threshold for a scale to be considered internally consistent. These results indicate that using the original first item wording would create a more internally consistent and therefore reliable scale than either of the two alternatives. The original first item wording ('I identify with the VHT programme') was therefore included in the final VHT programme social identification measurement scale.

For the [insert village name] VHT social identification scale battery, all three item combinations led to all items loading at >.7 on the first factor. All three combinations also returned a Cronbach's alpha coefficient >.7. All three options therefore seemed viable. The original first item wording loaded on the first factor the highest (.915) when compared to the other two first tem options. It also, in combination with the other three items returned a slightly higher Cronbach's alpha score than the other two first item options. The original first item wording was therefore included in the [insert village name] VHT Social Identification measurement scale. While the difference between the results was small, using the original

first item wording nevertheless creates a more internally consistent and therefore reliable scale than either of the two alternatives.

Do the two social identification measurement scales measure identification with distinct identities?

Exploratory factor analysis of the remaining eight items indicated that one factor accounted for 82.4% of the variance and a second factor accounted for 17.6% of the variance. All items loaded >.6 on the first factor with no cross loadings on the second factor of >.28. The factor loadings for each of the items appear in Table 5.10.

Table 5.10: VHT social identification measurement scale variable factor structure (2) and item weightings

Social identification battery	Variable names and item statements	Median response[a] (n=298)	Factor 1	Factor 2
			Eigenvalue	
			5.066	1.079
VHT programme social identification scale	FIDENTG: I identify with the VHT programme [b]	2	.62	.02
	FCOMMG: I feel committed to the VHT programme [b]	1	.76	.16
	FGLADG: I am glad to be a VHT [b]	1	.81	.26
	FDEFING: Being a VHT is a big part of who I am as a person [b]	2	.91	-.88
[Insert village name] VHT social identification scale	FIDENTL: I identify with the [insert village name] VHT [b]	1	.83	.25
	FCOMML: I feel committed to the [insert village name] VHT [b]	1	.81	.2
	FGLADL: I am glad to be a [insert village name] VHT [b]	1	.85	.28
	FDEFINL: Being a [insert village name] VHT is a big part of who I am as a person [b]	1	.76	-.2

[a] Response scale 1-5, 'strongly agree' to 'strongly disagree'
[b] Item was reverse coded when included in the aggregate score so higher score indicated higher social identification

The factor analysis was rotated (promax) to allow easier interpretation of the loadings without changing the relationship between the items (Abdi, 2003). It was apparent that the items all primarily contribute to a single underlying factor. Based on these results it was not possible to conclude that there were two distinct social identifications. Specifying two factors in the analysis also led to an output termed a 'Heywood Case'. This indicates a 'structural misspecification' in the proposed two factor model (Kolenikov and Bollen, 2012). These combined results led to the [insert village name] VHT social identification scale items being removed from further analysis given it provided no differentiated information from the VHT

programme social identification scale items. The four item VHT programme social identification measurement scale was used to establish VHT social identification scores. These four items appear in Table 5.11 and again in Table 5.14 as the final VHT social identification measurement scale.

Is a single social identification item sufficient for measuring VHT social identification?

There was a suggestion in the literature that a single measurement scale item may be sufficient for measuring social identification when space constraints do not allow for the inclusion of a greater number of items (Postmes et al., 2012). The evidence presented in support of this suggestion was data indicating the single item was highly positively correlated with a larger battery of items that included the single item. The battery of items used were from Postmes et al (2012) and were therefore the same as those used as the basis for the development of the VHT social identification measurement scale.

When the first item of the VHT programme social identification measurement scale was correlated with the summed total of the four items of the scale it produced a polychoric correlation coefficient of .803. This would appear to indicate that a single item measure may be adequate for measuring identification with VHT programme social identity when space constraints do not allow for a four item (or longer) measurement scale. The correlation coefficients appear in Table 5.11.

Table 5.11: VHT social identification measurement scale item polychoric correlation coefficients

	VHT programme social identification variable names and item statements	FIDENTG	FCOMMG	FGLADG	FDEFING
1	FIDENTG: I identify with the VHT programme	1	-	-	-
2	FCOMMG: I feel committed to the VHT programme	.52	1	-	-
3	FGLADG: I am glad to be a VHT	.48	.55	1	-
4	FDEFING: Being a VHT is a big part of who I am as a person	.5	.53	.53	1
	VHT programme social identification score	.8	-	-	-

Estimating a VHT social identification score

VHT social identification scores were estimated for each respondent by summing the scores of the four VHT programme social identification items after reverse coding[42]. The items were reverse coded so a higher score indicated an increase in the strength of identification.
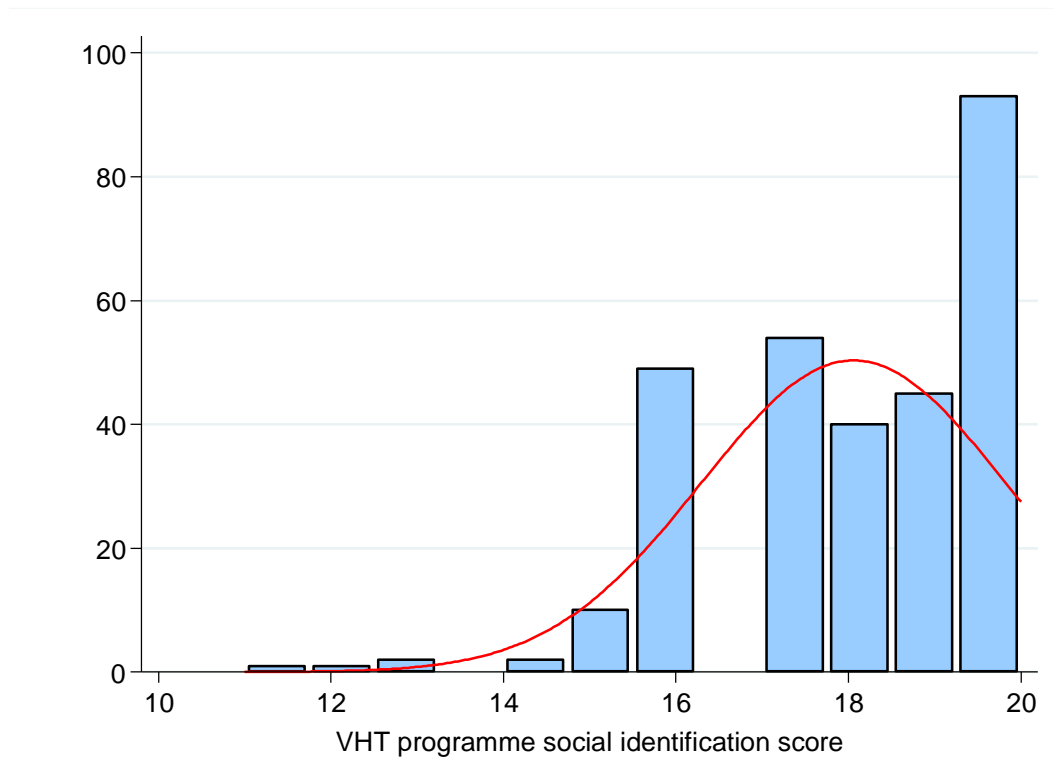
Figure 5.1: Distribution of VHT programme social identification scores

The two measures of central tendency (i.e. mean and median) were only slightly different for the VHT programme social identification scores. The mean VHT programme social identification score was 18.06 (SD 1.77) with a median score of 18, a lowest score of 11 and a highest score of 20. The distribution of the VHT programme social Identification score among the VHT sample is presented in Figure 5.1. The distribution of scores is moderately skewed to the left (skewness = -.63), has a heavy tail as indicated by the positive kurtosis (kurtosis 3.09) (McNeese, 2010, Field, 2013) and is slightly bimodal with a variance of 3.12. The shape of the distribution is similar to that for the VHT work motivation scores reported in Chapter 4. As with that distribution, despite the moderate skew and heavy tail, it falls

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[42] While all scale items were positively worded, the option 'strongly disagree' scored five while 'strongly agree' scored one. They therefore required reverse coding so a higher score was indicative of greater identification.

within the conventionally accepted parameters of 'normality' such that parametric statistical tests may be applied (Kline, 2005).

5.4.4 Criterion validity: performance of VHT social identification scores against key variables

The criterion validity of the VHT programme social identification measurement scale was explored using descriptive analysis of the estimated scores as explained in the Methods section. The focus was on several criteria of criterion validity, namely; predictive, concurrent and discriminant validity

Predictive, concurrent and discriminant validity

With regard to predictive validity, correlation coefficients were calculated for VHT programme social identification and variables indicative of status and respect, job satisfaction, work motivation and intention to leave (see Table 5.12). Statistically significant correlations were recorded for all comparison variables consistent with predictions made. Specifically, VHT social identification was found to increase as VHT status and respect ($p<.001$), job satisfaction variable 1 ($p<.001$), job satisfaction variable 2 ($p<.01$), and work motivation ($p<.001$) increased. VHT programme social identification was also, as predicted, found to have a negative linear relationship with intention to leave 1 ($p<.05$), and intention to leave 2 ($p<.001$). That is, as VHTs identified more with the VHT collective, they were less inclined to leave the VHT role.

Table 5.12: Correlation coefficients for VHT programme social identification scores and key comparison variables

n	Status and respect	Job satisfaction 1	Job satisfaction 2	Work motivation	Intention to leave 1	Intention to leave 2
298	.26***	.37***	.18**	.69***	-.14*	-.38***

*p<.05, **p<.01, ***p<.001

With regard to concurrent validity, it was proposed that mean VHT programme social identification scores would be higher in the inSCALE intervention areas than in the control area (see Table 5.13). No statistically significant differences between the intervention areas and control area of the VHT respondent were found for VHT programme social identification scores. As with assessments of the VHT work motivation scale related to criterion validity (see Chapter 4), because the inSCALE interventions had not previously been implemented, there is no prior data on their impact on social identification. It was proposed that the

interventions would influence social identification but it was a bold prediction based on theoretical assumptions. This result should therefore be interpreted with caution.

That no statistically significant difference in mean VHT programme social identification scores between intervention and control areas was detected may be explained by VHTs already identifying collectively. The VHT programme social identification scores were high. They ranged from 11 to 20 with a mean score of 18.06 and a total score of 20. With four items in the scale, this means there was a mean, per item score of 4.5 where a score of 4 indicated agreement and 5 strong agreement with statements indicative of social identification. These high scores combined with small differences across intervention areas suggest that, in common with VHT work motivation scale (see Chapter 4), a larger sample size may be required to detect small differences between high social identification scores.

Table 5.13: Mean VHT programme social identification score by inSCALE intervention arm

inSCALE intervention arm	VHT programme social identification		
	Mean	**Median**	**SD**
Overall (N=297)	18.06	18	1.77
Control (n=102)	17.95	18	1.97
Community (n=98)	17.82	18	1.6
Technology (n=97)	18.42	19	1.66

*p<.05, **p<.01, ***p<.001

The discriminant validity of the VHT social identification measurement scale was explored in the previous section where it was established that the items proposed to distinguish between VHT programme social identification and local, village level VHT collective social identification did not do so. The items related to identification with the village level collective of VHTs were discarded as a result. Further checks of discriminant validity may be more fruitful if identities not so apparently similar were used for comparison. For instance, identity as a Ugandan. The distinction between VHT programme and village level VHT identity was too fine for this analysis to detect despite qualitative indications that it was a meaningful distinction for Ugandan VHTs.

Overall the measures of criterion validity appear to indicate the VHT programme social identification scale's validity. Such conclusions can only cautiously be made given the risk of social desirability bias and the lack of difference in mean scores between intervention and control areas (i.e. concurrent validity - discussed above). These issues are explored in the Discussion section of this chapter. The range of ways in which social identification with the

VHT collective could occur is also explored in depth through a qualitative methodology in Chapter 6.

5.4.5 Reliability: assessing VHT social identification measurement scale consistency

The polychoric inter-item correlation coefficients for the VHT social identification measurement scale items reveal that they are positively and moderately correlated. This indicates that they are internally consistent. The correlation coefficients appear in Table 5.11.

The VHT programme social identification measurement scale items produced Cronbach's alpha scores of .69 (see Table 5.9). This is score considered 'acceptable' for a scale whose results are to be used for research purposes (Bland and Altman, 1997, Streiner and Norman, 2008).

The intraclass correlation coefficient for VHT programme social identification by the sub-county of the VHT was 0.125 (95% CI 0.02-0.23). That is, approximately 12.5% of variation in the VHT social identification score was due to variation between clusters, the rest was due to variation between VHTs.

The intraclass correlation coefficient for VHT programme social identification by the fieldworker who administered the survey was 0.249 (95% CI 0.03-0.46). That is, approximately 25% of variation in the VHT programme social identification score was due to variation between fieldworker administrators of the measurement scale, the rest was due to variation between VHTs. In further sensitivity analysis it was discovered that a large proportion of this variation was driven by one fieldworker, one of ten who collected survey data. 'Fieldworker 21' who collected 51 surveys recorded a mean VHT social identification motivation score of 19.35 (SD 1.45, median 20) among sampled VHT respondents. Eliminating data collected by fieldworker 21 from the analysis brought down the intraclass correlation coefficient to 0.169 (95% CI 0.00-0.35). That is, approximately 17% of variation in the VHT social identification scores was due to variation between fieldworker administrators of the survey, the rest was due to variation between VHTs. This small improvement, coupled with the large number of surveys collected by the fieldworker, led to the decision to retain data collected by fieldworker 21.

In common with reflections from the development of the VHT work motivation measurement scale presented in Chapter 4, future use of the VHT social identification measurement scale should control for clustering and fieldworker effects on VHT social identification. In addition, future use of the scale should include thorough training of fieldworkers and pre-testing of the tool to ensure consistency of implementation across fieldworkers. While such an approach was taken in this study, it seems there was still a fieldworker effect. Utilising a larger pool of fieldworkers may also be advantageous. This would confer the benefit of making it comparatively straightforward to exclude from analysis data collected by a fieldworker who was inconsistent give their lessened contribution to the pool of total data.

5.5 Discussion

The final, four item, VHT social identification measurement scale (see Table 5.14) was the product of a development process that aimed to produce a practical, valid and reliable measurement instrument. This section reviews how successfully this aim was achieved.

Table 5.14: Final VHT social identification measurement scale item wording

No.	Item wording
1	I identify with the VHT programme
2	I feel committed to the VHT programme
3	I am glad to be a VHT
4	Being a VHT is a big part of who I am as a person

This chapter has described the methods and presented the results of content, construct and criterion validity tests as well as tests for measurement scale reliability. In so doing it has been concluded that:

- The VHT social identification measurement scale items have good content validity as they were developed based on the available theoretical and empirical social identification literature. Despite alternatives being tested, the final versions were similar to those discovered through the literature review.
- With regard to construct validity:
  - The VHT social identification measurement scale items have good cognitive validity as they were found to be understood by, and acceptable to, Ugandan VHTs according to analysis of VHT interview and fieldworker debrief data. This was

despite some misgivings regarding VHT interpretation and understanding of the word 'identify'.

- o Construct validity tests followed accepted methods but failed to confirm identification with two distinct social identities; VHT programme and [insert village name] VHTs.

- o A single social identification scale item may be sufficient when seeking to measure VHT social identification.

- Tests for criterion validity broadly support claims of scale validity but caution should be exercised regarding this conclusion given the high scores recorded and potential issues around measurement scale sensitivity. VHT social identification and work motivation scores were strongly, positively correlated. Differences in scores by were recorded against predictions.

- Claims of VHT social identification measurement scale reliability were supported by the combined items producing scores at a conventionally 'acceptable' threshold on measures of internal consistency.

Each of these key conclusions is discussed in light of the results presented in this chapter and, where appropriate, previous research. The utility of the VHT social identification measurement scale for use with Ugandan VHTs and CHWs operating in other settings is explored. The chapter concludes with a comment regarding the stated aim of establishing the extent to which the proposed VHT social identification measurement scale actually measures VHT social identification.

5.5.1 Content validity of the VHT social identification measurement scale

Postmes et al's (2012) four item social identification scale was adapted for use with Ugandan VHTs to create the VHT social identification measurement scale. The principle reasons for using this measurement scale were that it was firmly grounded in the original theory of social identity and identification, it is relatively brief and its use was recommended in the literature when hypotheses relate to social identification rather than the sub-components of social identification.

As with the VHT work motivation measurement scale, the methodical approach taken to the development of the VHT social identification measurement scale, drawing on theoretical and empirical data, contributed to confidence that appropriate dimensions of the construct were

included and that this aspect of the scale's design was not 'deficient' (Kanfer et al., 2012) and therefore invalid (Messick, 1995). Qualitative data from interviews with VHTs also allowed the specific wording of scale items to be altered in response to VHT understandings of key concepts and terms. For instance, VHTs indicated that 'iCCM VHT' and 'local VHT' identities were not meaningful to them and they were dropped from the measurement scale. What seemed to be meaningful was specifying the village in which a VHT was based and operated. Incorporating this finding into the design of the measurement scale added to its content validity.

The process of measurement scale development followed, in conjunction with amendments made in response to the data this process produced, indicate that the VHT social identification measurement scale has content validity.

5.5.2 Construct validity of the VHT social identification measurement scale

The utility of qualitative 'cognitive' interviews with VHTs

Cognitive validation as a methodology allowed for a structured approach to accessing and evaluating feedback from target respondents regarding the meaning of the measurement scale items. The approach enabled the assessment to be made that certain words and turn of phrase were misleading and unlikely to be valid. In some instances these items were altered while in others they were removed. In one instance a seemingly problematic word – 'identify' - was retained but two alternatives were also included for later comparison; one suggested by fieldworkers and the other by a social identification researcher (Haslam, 2011). Importantly, the cognitive interviews enabled a problematic word to be identified and facilitated a process where alternatives were identified and an evidence based solution as found. The word 'identify' was eventually retained in the measurement scale because it produced a higher factor loading on the underlying construct than the two other options. While further research is warranted to explore VHT understanding of the word 'identify', the cognitive interviews contributed to a survey development process that identified the best available scale item wording. No notable differences in VHT testimony based on gender were revealed in the data analysis though a more explicit gender focus may have yielded more nuanced insights.

Only one VHT identity was meaningful to VHT respondents

It was initially proposed that there would be three different social identities that were relevant to VHTs in the context of their work; VHT programme, iCCM trained VHT and Local VHT. It was discovered that 'iCCM VHT' was not a meaningful identity for the target population and it was removed. In addition it was found that 'local VHT' only became meaningful to VHTs when the local village which the VHT represented was named. Despite gathering data from measurement scale items referring to the [insert village name] VHT social identity, it was discovered these data were largely indistinguishable from that gathered from scale items referring to the VHT programme social identity. As a result the [insert village name] VHT social identity was also removed. Following the process to determine the preferred wording of the first scale item described above, this left a four item, VHT programme social identification measurement scale that was adopted as the final version (see Table 5.14).

One of the reasons for exploring different levels at which identification with the VHT collective took place was that evidence from the literature suggests smaller work groups rather than larger, organisational level collectives can have a greater influence on work place status, retention, satisfaction and motivation (Ashforth and Mael, 1989, Van Knippenberg and Schie, 2000, Haslam et al., 2000, Ellemers et al., 2004). It was the intention to explore whether this was the case for VHTs. While pursuing results for segmented VHT groups could have been pursued, the results indicated that VHTs only found the VHT programme collective to be meaningful. An attempt to split VHT programme identity into units that were meaningless to VHTs despite being theoretically plausible would almost certainly have produced redundant data and so this line of enquiry was dropped.

Is a single item measure of VHT social identification adequate?

A single item measure of VHT programme social identification may be adequate for measuring identification with this population of VHTs. A cautionary note should be struck though. Given the single item contains the word 'identify', which data from cognitive interviews suggest some respondents had trouble interpreting, it would be preferable to use the full, four item measurement scale. This is consistent with the recommendation from Postmes et al (2012) that a single item only be utilised when there is restricted space available and when hypothesising for effects based on identification as a homogenous concept. In other instances they recommended retaining the four item version adapted into the VHT social identification measurement scale. As the four item measurement scale has

been validated here, it is recommended instead of the single item measure for determining social identification for VHTs.

5.5.3 Criterion validity of the VHT social identification measurement scale

Measures of predictive validity indicate VHT social identification measurement scale validity with strong, positive correlations recorded, as predicted, between VHT social identification and work motivation as well as status and respect and job satisfaction. The positive and statistically significant correlation between social identification with the VHT programme and VHT work motivation replicates findings from studies in high income settings (Van Knippenberg and Schie, 2000, van Dick and Wagner, 2002, Wegge et al., 2006). As noted this is the first known study to explore this relationship in LMICs and with a CHW cadre. It is a promising result that indicates utilisation of social identity as a construct for understanding CHW motivation is warranted and that social identity may be feasibly and validly measured among CHW cadres similar to Ugandan VHTs. Positive correlation between VHT social identification and work motivation scores indicate the close relationship between the two, latent constructs. The nature of the relationship between the two constructs and their qualitative distinction is explored in some detail in the next Chapter.

The predictive validity of the VHT social identification measurement scale was further supported by the statistically significant correlation with both intention to leave variables. There was no notable change in social identification across intervention areas (concurrent validity). This may be reflective of a pre-existing level of identification with the VHT collective rather than a lack of sensitivity in the scale given the high scores recorded across the board.

These results, in conjunction with the relatively small sample size in each district, the variations in scores generated from survey data collected by individual fieldworkers and by cluster, and recommendations of caution around strong conclusions being drawn from borderline results from Likert scale items in the literature, lead to the recommendation of further studies to explore VHT social identification measurement scale validity (Sullivan and Artino Jr, 2013).

Overall, the VHT social identification measurement scale would appear to have criterion validity however high scores for social identification were recorded across all comparison variables. Given this, and despite the statistically significant correlations recorded in

alignment with predictions, re-testing with a larger sample size would provide stronger assurances regarding the scale's criterion validity.

VHT social identification measurement scale sensitivity

Consistently high VHT social identification scores indicate that the measurement scale may lack sensitivity. It may also be the case that social desirability bias, discussed in Chapter 4, drove up mean scores. The most plausible explanation though, given the apparent content, construct and criterion validity of the measurement scale, is that VHTs have a high, pre-existing level of social identification with the VHT programme (as well as work motivation – see Chapter 4) and that the interventions could do little to improve this. Further research with a larger sample size is warranted to explore sensitivity and to potentially provide support for the cautious interpretation posited here.

5.5.4 Reliability of the VHT social identification measurement scale

The four item social identification measurement scale was found to be internally consistent and produced a Cronbach's alpha score in the 'acceptable' range. Tests for clustering and fieldworker effects indicate that these variables should be controlled for when analysing data produced by the measurement scale. The VHT social identification measurement scale appears to be a reliable measure of identification with VHT programme social identity.

5.5.5 Applicability of the VHT social identification measurement scale to other settings and respondent groups

As with the VHT work motivation measurement scale, contextual adaptation of the VHT social identification measurement scale is recommended before use with other CHW respondent groups. With appropriate adaptation it would appear that the four item VHT social identification measurement scale could be reliably and validly deployed. As with Ugandan VHTs, the utility of such deployment somewhat depends on a more nuanced understanding of the relationship between social identification and relevant variables of interest for that population. In the current study for instance, it is proposed that social identification with VHT programme social identity may indicate a willingness to engage in activities perceived to be in that collective's interests (Van Knippenberg, 2001). Exploring this qualitatively as well as the relationship between social identification, work motivation and performance, is the subject of the next Chapter. It is likely applications of the VHT social identification measurement scale to other settings and respondent groups would similarly

benefit from exploring the relationship between the latent construct of social identification and more tangible behaviours if they are to interpret what social identification with a work group means for that population.

5.6 Conclusion

The VHT social identification measurement scale appears to be a practical, reliable and valid tool for measuring VHT identification with VHT programme social identity. Despite this, high scores recorded across respondent groups suggest that further studies are warranted to assess scale sensitivity.

In addition, work motivation and social identification with the VHT social identity were found to be positively correlated according to data from the surveyed VHT population. The nature of this relationship requires further, qualitative examination to understand whether it is likely to result in the uptake of behaviours consistent with the objectives of the VHT programme. Such examination may also provide a greater understanding of what potentially leads to improved VHT performance, or lack of performance, and indeed whether this might be influenced by identity, identification and work motivation. It is this task that is the focus of the next chapter.

6. Exploring the relationship between VHT social identification, work motivation and performance and the influence of the inSCALE interventions

6.1 Introduction

In Chapter 5 the relationship between scores generated from the validated VHT work motivation and social identification measurement scales was assessed through the calculation of correlation co-efficients. These calculations revealed estimated scores for VHT work motivation and social identification were strongly, positively and statistically significantly correlated. This correlation does not imply causality. Instead, the relationship between the two constructs is proposed to be dynamic with each having an influence on the other over time (van Dick and Wagner, 2002, Turner and Reynolds, 2010).

This chapter aims to explore the nature of the relationship between VHT social identification and work motivation and the implications for VHT work performance. It also explores, through qualitative methods, the influence on this relationship of the inSCALE interventions despite the lack of statistical evidence for this influence as reported in the previous chapter. It does this by drawing on Van Knippenberg's model of social identification, work motivation and performance introduced in Chapter 3 (Figure 3.1) (Van Knippenberg, 2001, Van Knippenberg and Ellemers, 2003, Van Knippenberg et al., 2004). The purpose of looking at VHT social identification and work motivation is that they are proposed to be latent influences on VHT performance (Van Knippenberg and Ellemers, 2003, Haslam, 2004, Ellemers et al., 2004, Rowe et al., 2005, Mueller et al., 2005, Haines et al., 2007, Gopalan et al., 2012).

Van Knippenberg's model proposes that the psychological process leading from social identification through work motivation to work performance has four components. These are that (1) workers identify with the worker collective which leads to (2) a willingness to exert effort on behalf of that collective, (3) the motivation to perform well at work and (4) actual work performance. Van Knippenberg further proposes that this process is contingent upon three important moderators. These are that (1) worker social identity is relevant or salient to the worker at the time work performance takes place, (2) that the perceived social

norms and goals of the collective align with expectations of the workers from a programmatic perspective and (3) actual work performance is within the worker's control.

While the focus of the chapter is VHT social identification and work motivation, it is important to consider VHT work performance for two reasons. The first relates to the importance of a worker's belief that they are able to perform the tasks expected of them. This is the concept of self-efficacy (see Chapter 2, p. 25). The second relates to whether the outcome of work performance is experienced by workers as worthwhile and legitimate. This is the concept of outcome expectancy (see Chapter 2, p. 25). Empirical evidence supports both being important contributors to work motivation.

The chapter begins with a rationale for the methodological approach taken. This rationale specifically focuses on the challenge of utilising a qualitative methodology when researching latent constructs and the steps taken to address the risk of the social desirability bias encountered in Chapters 4 and 5. The methods used are presented next including an account of how Van Knippenberg's social identity model of work motivation and performance was used to develop the initial coding frame (Van Knippenberg, 2001, Van Knippenberg and Ellemers, 2003). Results and discussion sections follow where findings are analysed in relation to those from other peer reviewed studies of social identification and CHW work motivation.

6.2   Rationale for approach

There were two key challenges when selecting a qualitative method to achieve the aims of understanding the nature of the relationship between VHT work motivation and social identification as well as the influence (if any) of the inSCALE interventions (see Chapter 3). The first was that the focus of the enquiry was understanding latent rather than manifest variables. The second was to neither lead VHTs to their responses nor provide the opportunity for responses to be influenced by social desirability bias. Each of these challenges is explained below alongside a rationale for how they have been addressed.

6.2.1 Qualitative exploration of latent constructs: using a theoretical model to guide data analysis

Motivation, social identity and social identification are 'latent' constructs. That is, they are neither physically present nor countable but instead theoretical constructs proposed to have

an effect on tangible outcomes (Gray and Densten, 1998). While information regarding latent constructs is commonly inferred from tangible outcomes, any proposed relationship requires validation (Graneheim and Lundman, 2004, Kanfer et al., 2012). One way this can be done is by drawing on a suitable theory or framework to assist data analysis (Dey, 2003, Braun and Clarke, 2006). People interpret the reality of their lives in their own, subjective way and represent this interpretation to others through language (Bauer and Gaskell, 2000). Qualitative research methodologies can capture and organise these representations according to models based on theory[43] (Gray and Densten, 1998).

Van Knippenberg's social identity model of work motivation and performance (see Figure 3.1) was used during data analysis as the theoretical model for interpreting VHT representations of motivation, social identity and the process of social identification captured during interviews (Van Knippenberg, 2001). By drawing on this model to organise VHT interview data, both how well the data 'fit' the analytical categories of this theoretical model and how suited this model is for explaining VHT representations of social identification, work motivation and performance in the data could be assessed (Dey, 2003, Braun and Clarke, 2006). In combination with transparent reporting of research methods, drawing on theory in this way allows the reader to review inferences made from the data regarding the latent constructs under investigation.

6.2.2 Avoiding social desirability bias

Social desirability bias was proposed as one plausible explanation for the consistently high scores VHTs recorded on both the work motivation measurement scale presented in Chapter 4 and the social identification measurement scale presented in Chapter 5. By simply framing a question an implicit bias is introduced. If the participant is so inclined, responses may be informed by 'socially desirable responding' where an agreement with the perceived views of the researcher is sought (Matsumoto and Van de Vijver, 2010). The challenge for the methodology employed was to elicit the required data from target participants while avoiding this bias and without leading respondents to answers. A method that combines elements of 'narrative interviewing' (Jovchelovitch and Bauer, 2000) with 'free association' called 'the grid method' (Joffe and Elsey, 2014) was used.

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[43] Though not exclusively. Grounded theory, for instance, draws on data to develop theoretical categories.

Narrative interviews have been conceptualised as fora where respondents are encouraged to tell stories about their experiences (Jovchelovitch and Bauer, 2000). In so doing, what is most relevant or apparent to the respondent emerges along with the associations, both symbolic and more tangible, that are meaningful to them (Joffe, 2011, Bauer and Gaskell, 2000). The narrative interview approach encourages the respondent to articulate what they find most meaningful in the broad topic area of interest and thus access 'not only the symbolic, but also the emotional and experiential material that drives cognition and behaviour' (Joffe, 2011)(P. 212). Questions are framed in the language used by the informant while telling their story. An important component of the method is that an unrecorded debrief is conducted where respondent reflections and researcher recollections are treated as key data (Jovchelovitch and Bauer, 2000). Data generated from methods such as narrative interviewing that generate the 'free associations' of respondents (Joffe and Elsey, 2014) have been proposed as 'more unconsciously revealing than the meanings we (i.e. the researcher) might introduce' (Hollway and Jefferson, 2008) (P. 309). Particular insight may be gained into what respondents deem to be most important in the context of the research enquiry (Creswell, 2012). Such a method therefore has the potential to reduce the effect of social desirability bias when compared to methods where explicit mention of the constructs under investigation is made in the question.

There are a number of ways in which a respondent's free associations can be elicited. Joffe proposes simply presenting respondents with an empty, four box grid and inviting them to initially list the different images and words they associate with the construct, role, or concept under investigation in each quadrant before elaborating (Joffe, 2011, Joffe and Elsey, 2014). Her rationale for this approach is that it orients the respondent to the broad topic to be explored but invites associations with it and thus it 'produces data that follow the pathways of the respondent's thoughts and feelings rather than imposing questions and topic areas' (Joffe, 2011. P. 212).

The data collection approach adopted combined the grid approach (Joffe, 2011, Joffe and Elsey, 2014) with the narrative interviewing methodology (Jovchelovitch and Bauer, 2000). The specific details of the application of the methodology appear below. By avoiding explicit mention of the aims of the approach when interviewing VHTs, and instead exploring respondent led associations, the intention was to avoid, or at least minimise, the impact of social desirability bias.

6.3   Method

6.3.1 Sampling

VHT respondents were sampled based on inSCALE intervention area (technology, community and control). Sampling was conducted based on information from the inSCALE project data base. Due to the resources of the inSCALE project being stretched across a multi-component process evaluation, it was calculated that inSCALE could feasibly support a maximum of thirty associative interviews of approximately one hour duration. This calculation factored in personnel, training and travel expenses when sampling VHTs from across the three intervention areas in the nine inSCALE Districts in the Western region of Uganda. Based on previous experience working with the study population (see Chapter 3), this number was considered sufficient to reach data saturation.

Ten VHTs were randomly sampled from villages in each intervention arm. No VHTs refused to be interviewed but 11 were unavailable for interview or could not be reached. In these instances replacement VHTs were sampled randomly from a list of back up VHTs that met the sampling criteria. One VHT was recruited from the local army barracks when no other VHTs were available for selection in Kyankwanzi District. Male and female VHTs of different ages were also recruited in an attempt to capture the greatest range of responses.

In Table 6.1 the details of the thirty sampled VHTs are provided.

Table 6.1: Sampled VHTs demographic, motivation, and intervention arm

Intervention arm	Sex	Age group	District	Respondent no.
Control	Male	Not recorded	Kyankwanzi	3[a]
Control	Male	31-35	Kyankwanzi	9
Control	Male	31-35	Kyegegwa	13
Control	Male	26-30	Kyegegwa	14
Control	Male	26-30	Masindi	19
Control	Male	41-45	Masindi	18[b]
Control	Male	36-40	Masindi	27
Control	Female	26-30	Kyankwanzi	8
Control	Female	41-45	Masindi	26
Control	Female	41-45	Masindi	28
Community	Male	61-65	Hoima	4
Community	Male	36-40	Hoima	5
Community	Male	56-60	Kyegegwa	12
Community	Male	36-40	Buliisa	23

Community	Male	36-40	Masindi	24
Community	Male	36-40	Hoima	6
Community	Male	21-25	Hoima	7
Community	Female	46-50	Kyegegwa	11
Community	Female	21-25	Buliisa	22
Community	Female	41-45	Masindi	25
Technology	Male	31-35	Kyankwanzi	1
Technology	Male	41-45	Kyegegwa	15
Technology	Male	26-30	Kyegegwa	16
Technology	Male	26-30	Kiryandongo	30
Technology	Male	36-40	Buliisa	20
Technology	Male	26-30	Kiryandongo	29
Technology	Female	31-35	Kyankwanzi	2
Technology	Female	51-55	Kibaali	10
Technology	Female	36-40	Kyegegwa	17
Technology	Female	26-30	Buliisa	21

[a] Respondent was recruited when sampled respondents were unavailable. Not all demographic information was recorded
[b] Respondent was recruited from the top up sampling list

6.3.2 Data collection

Drawing on the grid approach (Joffe and Elsey, 2014) and narrative interviewing methodology (Jovchelovitch and Bauer, 2000) the key steps taken by fieldworkers during the VHT interviews were as follows:

1. VHT respondents were mobilised by the Malaria Consortium inSCALE project coordinator on the phone. Arrangements were made to meet in each VHT's village.

2. Recruited VHTs were greeted in their village by the Malaria Consortium inSCALE project coordinator and introduced to the researcher and fieldworkers. VHTs were accompanied to a private and quiet location (often under a tree or beside a hut) by a fieldworker and their informed consent was obtained in compliance with the ethical approval granted to the inSCALE project (see Chapter 1).

3. Respondents were invited to 'list the different feelings, words or images you associate with being a VHT' as outlined in the script at the top of the grid used by fieldworkers which can be found in Appendix 9.10. Instructions to fieldworkers appear in Appendix 9.11. The grid had four boxes and respondents were invited to nominate four 'associations' for elaboration. If more associations were nominated they were noted by fieldworkers and included in the data collection. While respondents were invited to

complete the grid themselves, all opted instead to speak with the grid completed by the fieldworker.

4. The fieldworkers drew out the respondent's associations through, initially, saying very little but instead making positive gestures and noises to invite elaboration. This was followed later by 'immanent questions' or questions that use the respondent's own words and phrases to ask them more about what they have said and to probe for more details regarding what took place and when (Jovchelovitch and Bauer, 2000). The immanent questions were based on 'exmanent questions'. Exmanent questions are pre-developed and focus on content areas of interest (Jovchelovitch and Bauer, 2000). In this case the exmanent questions were based on van Knippenberg's model (2001) and a reading of the literature (see chapter 2). Guidance was provided to the fieldworkers during their training on how to convert exmanent questions into immanent questions and the techniques introduced were practised in both mock interviews during training and in the pre-test.

The exmanent questions can be found in Appendix 9.12. Exmanent questions were carefully phrased in order to avoid fieldworker confusion. For instance, while the word 'motivation' was not used given its colloquial use as a synonym for payment (see Chapter 4), the construct of motivation was still explored using more appropriate language.

5. The interviews were digitally recorded and took between 22 and 53 minutes with a mean duration of 35 minutes.

6. When each respondent's associations had been fully explored through the use of immanent questions, the digital recorder was turned off and respondents were asked whether they had any further reflections regarding anything that had been discussed. Fieldworkers took notes of what was said.

6.3.3 Interview transcription and data management

Each interview was transcribed verbatim in English by the fieldworker who conducted the interview on the day the recording was made based on digital recordings of the interviews and fieldworker notes. Fieldworkers transferred all digital and written material to the researcher during the data collection period and did not retain copies. Data were anonymised in terms of individual's name and geographic location between analysis and reporting.

6.3.4 Fieldworkers

Two experienced Ugandan qualitative researchers were engaged to act as fieldworkers. They were trained for two days in the use of the associative interview technique, grid method, developing immanent questions from exmanent questions and transcription and translation. They also pre-tested the method with VHT respondents in Hoima and reflected on their experience of the approach before implementing it with the first VHT interviews. Both fieldworkers were fluent in the main languages of the Western region (Luo and Runyakitara) as well as Luganda (the main language of central Uganda which some VHT respondents preferred) and English.

A key quality control component of the training, pre-test and ongoing data collection was the daily debrief. This was where the fieldworkers and the researcher met to discuss any issues arising, the performance of the methodology and the translation of key words and terms.

6.3.5 Data analysis

VHT interview data were organised and analysed using a methodology known as 'analytical induction' (Braun and Clarke, 2006). Analytical induction combines a deductive or 'top down' method which allows for specific parameters to be put in place during data analysis as guided by previous work and theory with an inductive or 'bottom up' approach influenced by grounded theory[44] (Strauss, 1987). A process of analytical induction begins from a theoretical or programme position. The data the study yields is analysed both in the context of what the theory suggests may be there and what the data suggests should be in the theory (Glaser and Strauss, 2009, Green and Thorogood, 2013). Applying a process of analytical induction therefore provides the formal tools or guiding principles for reflecting on theory – in this case van Knippenberg's model (2001). The section below relating to the development and application of the coding frame outlines the specific details of how van Knippenberg's theoretical model (2001) was applied in the data analysis.

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[44] There are a number of ways in which research questions can be approached qualitatively. The 'grounded theory' approach suggests that any meaning attributed to collected data needs to be understood in context (interpretive) but without any pre-conceived notions (Glaser and Strauss, 2009, Green and Thorogood, 2013). While rich data have been produced using methods such as participant observation in the grounded theory tradition, such approaches have been employed with the freedom of allowing what emerges to become the key focus of the enquiry. The current research is more focused than this with data analysed for specific content (i.e. perspectives and experiences related to motivation, identity and social identification) in order to address the research question/s.

Thematic analysis of the VHT interview transcripts was conducted drawing on the analytical induction methodology. Thematic analysis is a method sensitive to confirming and cataloguing data in reference to theory as well as mapping unforeseen patterns in the data. It is therefore complementary to the iterative, analytical induction approach (Joffe, 2011, Braun and Clarke, 2006). Drawing on the systematic approach of content analysis (where classic content analysis involves the establishment of categories and then counting occurrences), and the 'subtlety and complexity' of phenomenological approaches[45] (Joffe, 2011), thematic analysis also provides a rich description of the data set as an output (Braun and Clarke, 2006).

Six key stages of data analysis were followed consistent with those recommended as part of an analytical induction thematic analysis approach (Green and Thorogood, 2013, Braun and Clarke, 2006, Joffe, 2011). These were to:

1. Develop an initial coding frame based on theoretically derived categories and field notes from the data collection,
2. Examine the full data set and update the coding frame,
3. Establish the reliability of the coding frame by assessing the coding correspondence of two coders and making minor modifications to the coding frame and its application as a result,
4. Code the data with the assistance of qualitative data analysis software,
5. Analyse the data with the assistance of qualitative data analysis software, and
6. Present results of the analysis in a report.

All six steps were followed and are demonstrated in the current chapter.

NVIVO 10 and 11 for Windows was used to assist the data organisation, coding and analysis.

6.3.6 From theoretical model to coding frame

The theoretical relationship between social identification, work motivation and performance is displayed graphically in Figure 6.1 (adapted from Van Knippenberg, 2001 and van

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[45] Phenomenology typically takes a main concept or idea and explores individual experiences of it. It does not approach collected data from a pre-determined perspective but instead groups 'significant statements' into 'meaning units' and ultimately summarises both 'what' respondents have experienced and 'how' they have experienced it. The process is completed with a description of the 'essence' of the experience for the individuals interviewed – i.e. the elements they had/have in common. It is by definition descriptive (Creswell, 2012).

Knippenberg and Ellemers, 2003). This model focuses on the psychological process involved and includes proposed moderating factors at each stage. Key concepts in the model such as social identity, social identification, identity salience and work motivation have been introduced and explored in earlier chapters. See in particular Chapter 2 for the theoretical background from the literature, Chapter 3 where the key aspects that informed intervention design are discussed, and Chapters 4 (for work motivation) and 5 (for social identification) where these key aspects informed measurement scale design.

The boxes of Figure 6.1 formed the basis of the initial coding frame used to organise and analyse the VHT associative interview transcripts. They also contain the questions addressed during data analysis that informed data coding.

Interview transcript data were also coded for the influence of the inSCALE interventions in accordance with the aims of the chapter. How this coding was conducted is explained in this section. Cross-cutting themes generated during data coding that influenced the relationship between VHT social identification and work motivation are presented at the end of the results section.

From key model components to codes

In this section the rationale for how the data were coded for each of the topic boxes of Figure 6.1 is presented. The four key components of the model are discussed first (shaded blue in Figure 6.1) followed by the three moderating factors (shaded green in Figure 6.1). Sub-codes were generated inductively during data analysis and are presented in the results section.

Key component 1: Group identification

The aim was to assess whether VHT respondents identified with the VHT collective. The specific question addressed was: do VHT respondents identify with the VHT collective?

Two specific approaches were taken. The first approach was to note instances where respondents referred to themselves in collective rather than singular terms (i.e. 'we' and 'us' instead of 'I and 'me') and how such collective reference indicated self-stereotyping or where similarities between group members are highlighted and differences largely ignored (Oakes et al., 1994, Leach et al., 2008). This approach is consistent with previous analyses where such references were attributed to group identification (Ashforth and Mael, 1989, Ellemers et al., 2004, Van Knippenberg and Sleebos, 2006). The second approach was to code data based on the three elements proposed to be characteristic of social identification. That is the cognitive (knowledge of belonging to the VHT collective), evaluative (some value significance

of group membership to the VHT) and affective (some emotional significance of group membership to the VHT) components (Tajfel and Turner, 1979).

Key component 2: Willingness to exert effort on behalf of the group

The aim was to assess whether respondents were willing to act and expend effort on behalf of the group. The specific question addressed was: are VHT respondents willing to act in what they perceive to be the interests of the group?

The approach taken was to code where respondents described instances where they acted on behalf of the group and in their perceived interests. The approach was predicated on the theoretical proposition that socially identified group members will act in accordance with their perception of group priorities (Turner et al., 1987, Van Knippenberg and Ellemers, 2003).

Key component 3: Motivation to perform well as a VHT

The aim was to assess what respondents feel motivates them to work and perform well as a VHT including the work actions they are motivated to take. The specific question addressed was: what motivates the willingness of respondents to work as a VHT?

What the respondents were motivated by was organised based on social ecological level (i.e. individual level, family, peer, organisation and community). This approach is consistent with previous approaches taken to health worker motivation (Franco et al., 2002, Martin et al., 2015)

Key component 4: Performance and experience of performance outcomes

The aim was to understand whether VHTs believe they are performing effectively, what informs this belief and how they experience the impact of their actions as VHTs. The specific question addressed was: do VHT respondents believe their performance as VHTs is effective and do they value the outcomes of this performance?

The data were coded based on VHT perceptions and experiences of their own performance rather than external performance assessments. That is, based on what they thought was meaningful. Particular attention was paid to instrumental or *task based* performance and context-based or *extra role* performance (Van Knippenberg and Ellemers, 2003).
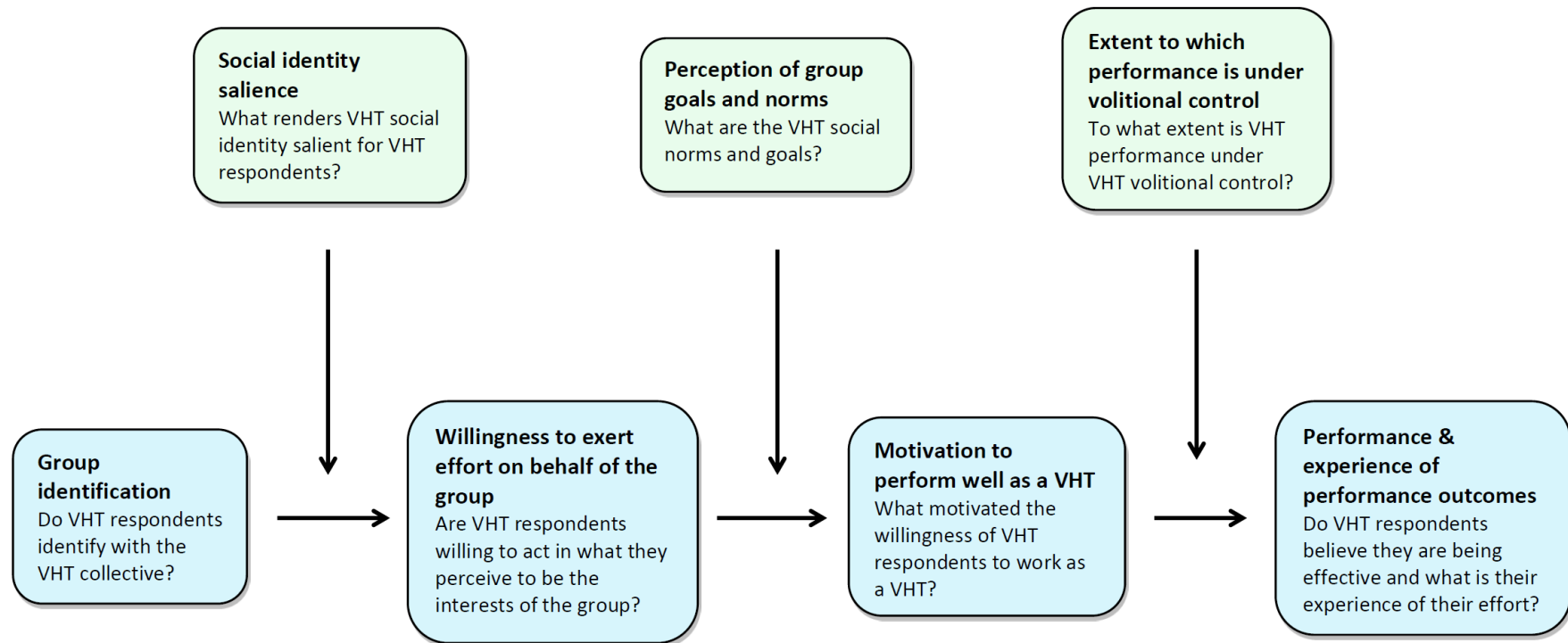
Figure 6.1: A moderated model of social identity, work motivation and performance with key questions addressed in data coding
(Adapted from van Knippenberg, 2001 and van Knippenberg and Ellemers, 2003).
NB: Key components shaded blue and moderators of process shaded green.

From key moderators of the relationship between model components to codes

Component moderator 1: Social identity salience

The aim was to assess under what conditions VHT social identity is salient. The specific question addressed was: what renders VHT social identity salient for respondents?

There were no *a priori* codes for VHT identity salience other than the assumption that notions of 'we-ness' would be linked by VHTs to examples and possibly comparison out-groups. In particular challenges to the collective are likely to render group identity salient (Haslam, 2004) as well as, key elements of the interventions such as community recognition (Community Arm), peer support and *SMS* reminders (Technology Arm). Coding therefore sought to capture examples of drives to act as a VHT and any associated stimuli related to either perceived group threats or features of the interventions that sought to render group identity salient.

Component moderator 2: Social norms and group goals

The aim was to capture the normalised attitudes, behaviours and goals of VHTs. Specifically, the focus of the analysis was to determine whether role performance was a social norm for VHTs. The specific question addressed was: are VHT social norms and goals consistent with role performance?

Coding of social norms took place when respondents articulated their views on the normalised attitudes and practices of VHTs. Coding of VHT goals took place when VHT respondents discussed ambitions for the collective in terms of VHT performance.

Component moderator 3: Extent to which performance is under volitional control

The aim was to assess VHT perceptions of their ability to perform as VHTs and whether this perception influenced whether role performance was actually a goal. The specific question addressed was: to what extent is work performance perceived to be under VHT volitional control?

There were no *a priori* codes for whether performance was under the volitional control of VHTs from their perspective. The coding was conducted with sensitivity to whether performance achievement, and lack of performance achievement, was attributed by VHTs to factors both within and outside their control as well as where performance was not attempted and the potential reasons for this.

Coding for the influence of the inSCALE interventions on the relationship between VHT social identification and work motivation

The aim was to assess the influence of the inSCALE interventions on the relationship between VHT social identification and work motivation. The specific question addressed was what influence did the interventions have in the three areas they were designed to influence (described in detail in Chapter 3)? These areas of influence were: emphasising the importance of the VHT role and the activities that define it to VHTs, promoting increased status and respect for VHTs in the community and health system, and increasing a sense of connection and accountability to the community and health system among VHTs.

Data were coded according to these three key areas of influence for each respondent. The results were then grouped based on the intervention arm of each respondent to ascertain whether effects occurred across or within intervention areas.

The final, post data analysis coding frame appears in Appendix 9.13.

6.4 Results

The results are presented in two parts.

1. Part 1 of the results (section 6.4.1) is organised into sections related to each component and component moderator from the model of social identification and work motivation (Figure 6.1). The order of presentation mimics the theoretical progression from group identification to performance *via* the moderators in the model. Thus the first section relates to group identification followed by social identity salience, willingness to exert effort on behalf of the group, perception of group goals and norms, motivation to perform well as a VHT, extent to which performance is under volitional control and finishes with performance and experience of performance outcomes.

2. Part 2 of the results (section 6.4.2) relates to the influence of the two inSCALE interventions on the relationship between VHT social identification and work motivation

At the end of the results section a summary of key findings is presented.

6.4.1 The relationship between VHT social identification and work motivation

Do VHT respondents identify with the VHT collective?

The interviewed VHTs did seem to identify with the VHT collective. They regularly referred to themselves in collective terms. Indeed all respondents referred to the VHT collective as 'we' at least once (average 27 times mentioned during interview) and, all but one VHT, as 'us' (average 13 mentions). Often this collective reference indicated self-stereotyping where respondents generalised attributes such as altruism to the collective, highlighting their group membership and the perceived similarities between group members.

> *We are serving our community without being paid, we actually want to serve our nation because if you are not trust worthy and dedicated, you cannot do this job where by you almost abandon your personal work … so for us we are serving the community*
> *Respondent 26 Female Control Arm*

In this instance Respondent 26 generalises an altruistic drive to all VHTs. Similar self-stereotyping was apparent when VHT respondents indicated their knowledge of belonging to the VHT collective and the value and emotional significance this belonging held for them. For instance, VHTs often emphasised their collective commitment to be volunteers despite the demands of the role and the restrictions it placed on their ability to generate income. Respondent 8 explains how one must often forgo revenue generating farming activities ('digging') to provide valuable VHT services to the community.

> *You know VHTs work very hard. Sometimes parents in the village start bringing their children for treatment very early which even prevents you from going to the garden. As you are finishing one patient another one has arrived. As you continue providing this treatment you will realise that time has already gone and you cannot go the garden any more. That is why I said that VHTs work a lot. Yet for us here in the village we survive on digging. But now that we dedicated to ourselves to volunteer we have no choice we continue helping the community.*
> *Respondent 8 Female Control Arm*

Knowledge that they belonged to a collective was also demonstrated by VHT respondents through their advocacy for perceived group based needs. In so doing VHTs regularly demonstrated that group based goals had been internalised and had been adopted as their own. Such advocacy was commonplace among VHT respondents.

> *They had promised to give us gum boots but up to now we have not received any, they only gave us soap only once and yet they want us to always be smart and yet*

> *we are now called doctors who need to be smart always. They should always remember us, even if they give us 1,000UGX[46], we shall be grateful.*
> *Respondent 4 Male Community Arm*

A willingness to advocate on behalf of themselves and their VHT group members is explored in greater depth below in the results section relating to the willingness to exert effort on behalf of the group.

VHT respondents consistently emphasised the value of the VHT role to them as individuals and to the community, their satisfaction at bringing valued health services to the community and their enjoyment of the role. On some occasion's enjoyment appeared to be simply a function of being part of the VHT collective (i.e. affective identification).

> *And at times when I am moving in the community, even my fellow VHTs greets me as a VHT and I also do the same. That makes me happy.*
> *Respondent 18 Male Control Arm*

The data analysis included exploring alternative identities that VHT respondents may have identified with. Of particular interest were the different categories of VHT linked to the level of training they had received such as those trained in iCCM or those whose training focused on health promotion. In common with the results presented in Chapter 5, VHTs referred themselves as simply VHTs. They indicated they were part of one collective rather than differentiating between VHT categories. No respondents indicated different classifications of VHT were meaningful to them.

> *So us VHTs, we are now one, even if you meet a fellow VHT, you sit down and you share a lot*
> *Respondent 21 Female Technology Arm*

One alternative identity that did emerge from the analysis was that of a parent. Several VHTs described how being a VHT complemented this role as it allowed them access to drugs which benefited their children. Being a VHT seemingly helped fulfil a key parental aim of ensuring the health of their children. That this aim was seen to be complementary to the VHT role served to emphasise the value parents, who were also VHTs, saw in the VHT role.

> *… it helps me as a VHT to get drugs easily … being a VHT helps me to do roles well even me when my child falls sick I can treat him or her well.*
> *Respondent 7 Male Community Arm*

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[46] UGX = Ugandan Shillings. 1,000UGX = .39 US cents at the time of the research and .28 US cents 3.3.17. Source www.xe.com accessed 3.3.17.

According to the accounts of VHT interview respondents, VHTs seem to strongly identify as a group. This identification had *cognitive*, *evaluative* and *affective* components as discussed above. This identification did not vary according to respondent gender or intervention arm. In the next section the conditions under which this identity was salient for VHT respondents is explored.

What renders VHT social identity salient for respondents?

There were a number of contexts which rendered VHT social identity salient. These were primarily when VHTs confronted work challenges including equipment and drugs shortages, when they received recognition and validation from community members and members of the health system for delivering appropriate services, and from interaction with VHT peers.

VHTs described a range of challenges they faced in their work. Many of these restricted their ability to perform and are discussed below in the section relating to whether performance was within their volitional control. Work challenges also appeared to validate the VHT role. VHTs took pride in maintaining their effort and explaining an approach they valued and suggested was typically adopted by the VHT collective. It was apparent that when these challenges occurred the VHT role and identity was salient for VHT respondents. Explaining their work challenges and that they were an important part of the VHT role was a frequent focus within VHT interviews. For example, when challenged by a member of the public, and at the acknowledged risk of being unpopular, respondent 24 related the practices they believe are typical and appropriate for a VHT to take in relation to following treatment guidelines.

> *They say 'Doctor, you are telling me that there is no malaria and once I touch the child, the body temperature is really hot' but I continue to explain to them. At times in such situations, some VHTs were telling us for them they feel sympathetic and give anti-malarials but we were told not to do it, even if it means being hated, let it be but let us stick to the guidelines*
> *Respondent 24 Male Community Arm*

Having drugs to treat, the means to travel to collect drugs and even branded clothing also seemed to render VHT identity salient for VHT respondents.

> *… now everybody in the sub county knows me, if I put on my VHT shirt, everybody calls me whenever I am, they even make me sit at the front seats, that makes me feel good.*
> *Respondent 16 Male Technology Arm*

In their work capacity VHT respondents noted instances where they interacted with community members, peers and members of the health system. A sense of connection was an important feature of these interactions and this is discussed in a cross cutting section below relating to the influence of the inSCALE interventions. What was also notable from the interview transcripts was how these interactions rendered VHT identity salient, often through comparison with a member of an out-group or through confirmation of practices and goals with an in-group member. For instance, for one respondent an encounter with their supervisor, where they explained the collective challenges VHTs face, was related in the interview in terms of 'them' and 'us'.

> *Another thing is there is need for more supervision so that we get more guidance, but at least yesterday they checked on us and we consulted on a few things … there are times when patients come to our places at night when we do not have paraffin or medicine, so when our supervisors come, we use that opportunity to tell them our problems*
> *Respondent 4 Male Community Arm*

The results demonstrate that there are many aspects of their working lives that render VHT identity salient. This includes during service provision interactions with community members, the settings where work performance occurs. Again, these results were consistently found for respondents of both genders and in all three-intervention arms. Given these data suggest VHT identity is salient at the point of service provision, it would appear that social identity salience is not a barrier to improved VHT work motivation or performance.

Are VHT respondents willing to act in what they perceive to be the interests of the group?

VHTs were willing to act in what they perceived to be the best interests of the group. The principle manifestation of this willingness was advocacy for improved VHT working conditions and expanding the VHT role to treating adults and older children. It was evident that VHT respondents saw the interviews as a key opportunity for making their needs plain. There was an apparent and consistent assumption that if a need was made evident that they would be provided for. This may have been due to Malaria Consortium's known sponsorship of the government's VHT programme in the area as well as the research interviews. Malaria Consortium branding also appeared on the fieldworker's clothes and vehicle. One respondent emphasised that their needs should be met as there was a 'mzungu' (or white person) with the research team. The apparently self-evident meaning was that, given there

was a white person present, clearly there were the funds available for the necessary equipment and other supplies the VHTs identified as being in short supply and great need.

> *For my case I mentioned that I get only ten thousand. So when you go back tell them that we did not receive feedback on the training where we were asked about our income levels. I have even seen you have a 'mzungu' with you.*
> *Respondent 27 Male Control Arm*

Whether adopting the role of group member to advocate in this way was due to the perception that a collective voice was more likely to yield a positive result, or the product of genuine adoption of the group's needs as their own, was unclear. Nevertheless, if it is the research encounter that renders VHT identity salient, it still serves to illustrate that ensuring better working conditions, commonly drug supply but in this instance payment, were collective goals that had been adopted by individual VHTs.

While passionately advocating for greater financial and logistical support VHT respondents also commonly emphasised the challenges they face when seeking to improve child health outcomes. In so doing they demonstrated that they had adopted the VHT programme goal of improved child health as their own. Again, whether this was pragmatic or genuine is moot. It nevertheless indicates that identifying collectively was seen as a way to further the interests of the VHT collective. As such, regardless of whether it is conscious and pragmatic or more intuitive, VHTs identify with the collective and are motivated to act in its perceived interests.

> *Well for us VHTs, at times we get some challenges , we are also requesting for some assistance, as you can see most times we work for free, we are also human beings who have a lot responsibility, we have a lot of work, now I try to imagine, there are times we fail to eat, you can wake up in the morning as soon as you open the door, a patient is brought to your attention and before you finish treating this child, then another one is also brought and therefore you find that we fail to get an opportunity to do our other responsibilities, so we are requesting that may be you get us something, it can help us*
> *Respondent 17 Female Technology Arm*

VHT respondents of both genders and across intervention arms were passionate when advocating for improved working conditions. This demonstrated their willingness to exert effort on behalf of the collective. In their advocacy VHT respondents also normalised the practices and goals of VHTs. The next section explores whether performing effectively as understood by the VHT programme is a social norm and goal for VHT respondents.

Are VHT social norms and goals consistent with role performance?

VHT respondents normalised a range of VHT behaviours, behavioural outcomes and the temperament and motivation considered necessary for successful VHT role performance. They typically dwelt on the range of tasks they performed and the personal capacities they thought necessary for VHTs to possess to perform them. It was evident that achieving improved child health was a collective performance goal.

> *…we treat children from 5 years and below because we do not treat children above 5 years. Indeed treating children is really a good thing because now children are no longer convulsing with severe malaria unlike before when they used to convulse but now we test and if it is fever, we give them medicine*
> *Respondent 28 Female Control Arm*

While such performance goals were commonly expressed across the respondent group, and are compatible with role performance, specific discussion of technical elements of role performance was limited. Here Respondent 26 discusses the referral process but engaging in even this level of procedural detail was uncommon. Instead general comments regarding improving community health were the norm.

> *We treat all children but in case one has got danger signs, we do not treat them, we just give them referral letters and they go to the main hospital*
> *Respondent 26 Female Control Arm*

Indeed the main emphasis regarding what was required for VHTs to meet the goal of improved child health related to temperamental qualities seen as necessary for addressing the challenges of the role. The emphasis was on the holistic effort required rather than specific components of the role. The need for an even temperament and a great deal of patience in light of the common occurrence of being woken in the night to tend to a sick child was, for instance, repeatedly emphasised.

> *That means that any time whether you are in the garden or even at night when a patient in the village brings a sick child to you, you have to treat. Sometimes you receive a phone call from a parent or a caretaker who calls you maybe when you are traveling for your own activities. I must then first stop and provide the service before I can continue with my journey*
> *Respondent 7 Male Community Arm*

By normalising aspects of work ethic, temperament and altruism VHT respondents identified characteristics of VHTs that, in their view, were essential for role performance. The emphasis on these 'extra role' attributes rather than task based proficiency suggests that VHTs feel approach rather than skills are more important for performance. It could be the case that

VHTs felt task proficiency was implicitly understood to be important but the emphasis is relevant. This is because VHT programme goals relate to achieving improved child health through appropriate diagnosis, treatment and referral while it seems VHT respondents believe improved child health is best achieved through patience, flexibility and hard work. While these are not mutually exclusive it is a matter of priority and perceived importance. Where the VHT programme emphasises procedural and task based competencies, VHT respondents first emphasised personal qualities like warmth, generosity, and responding to emergent needs in a neighbourly way. More than two thirds of respondents discussed in some detail the importance of engaging with and being responsive to the community.

> *Yes, like I have told you, I have gained community support because when they come to my home, I try to show them love for example they may come to my home in the morning and find me taking tea, I try by all means to share with them some tea … Also there are moments when a care taker comes with a sick child who is may be hungry, so what I also do is I get some food from my house and give this sick child and you find that one gains more community support and love.*
> *Respondent 4 Male Community Arm*

> *If you do not have good relations with the community, you cannot do any thing apart from being proud even some body can fear to approach you in your home but once they know that you are free with them, you are flexible they also come seeking your services well knowing that you also care for them and can there fore treat their children. For example, some body can come to your home with a sick child and may be finds you preparing your food, but instead of attending to their needs, you continue with your work, not bothered about their presence until the child conditions get worse. Now in case a parent sees such behaviours demonstrated by a VHT, they would not bother to come to you again, they would instead go to the nearest health centre*
> *Respondent 28 Female Control Arm*

In terms of normalised performance goals, when invited to share what they most associate with the VHT role, VHT respondent's overwhelmingly emphasised extra role rather than task based performance. This emphasis on *extra role* performance cut across results sections and is explored further in the results sections below related to what motivates VHTs and whether they believe their performance is effective. It was common to respondents of both genders and across intervention arms. The next section concerns what motivated VHTs to perform in their VHT role.

What motivates the willingness of respondents to work as a VHT?

It was apparent from the VHT interviews that there were a range of motivations for VHT work performance. At the individual level, VHTs commonly indicated that they were motivated by the advancement they achieved through knowledge gain, their sense of calling, duty and altruism and the happiness the role brought them.

> *I have seen with this kind of work, people begin calling you 'doctor', which is also good thing because finding somebody who is not educated being called a doctor is really a good thing and I feel it is something good, such a word of being called a doctor is really motivating*
> *Respondent 29 Male Technology Arm*

In addition VHTs appeared to be motivated by the status and respect afforded to them by virtue of the health benefits they were perceived as bringing to their communities. Being motivated by community respect they felt was contingent upon positive impact of their work was widely communicated by VHT respondents. This appeared to be amplified by the gravitas of the title 'VHT' used by community members when addressing them.

> *We are now known in the community, we became bosses, we became very important people, whenever we pass, they say the VHT has come, even when people see me, they clear the way for me and this makes me motivated. … I feel so happy and even the people I was staying with began realising that the work I am doing is worthy*
> *Respondent 17 Female Technology Arm*

An additional, aspect of the status and respect afforded VHTs by virtue of their role was the leveraging power this appeared to confer. There was a pervasive sense among interviewed VHTs that their service and accountability to the community led to a symbolic status that was both intrinsically motivating and worth pursuing for the possibility that it could be leveraged for material reward. This seemed to be an important motivational driver for at least half of the VHTs interviewed to become and maintain their role as a VHT.

> *In case I need something, it is easier to get it, in case somebody is looking for my home, they can easily be directed to my place. In case there is need to get something on credit from somebody's shop, I am easily given (laughs) because I am a VHT. So that makes me happy and makes me want to continue doing this work like when you tell me to leave this work, I would just know that I am going to miss out*
> *Respondent 16 Male Technology Arm*

At a family level, six VHT respondents recognised that the VHT role granted them access to drugs that had benefits for their own children. This benefit was seen as motivating but was also recognised as being accompanied by a level of accountability to the community. This

was due to the power the community had to reject them as a VHT resulting in a loss of their privileged access to drugs.

> *the fact is that I was elected as a volunteer with one of the reason being that I am also a parent with children so in case I do not embrace this service in my village, it means that even my children would not benefit from the service, so I should continue to do my work*
> *Respondent 6 Male Community Arm*

At a VHT peer level, cooperation and collegiate support was referred to by a third of VHT respondents as highly valued. Often this involved tangible support in terms of providing supplies when theirs were low or finished. At other times it was more moral support in the shared pursuit of improved community health.

> *the cooperation that exist among the VHTs to assist the households in the community in my village by ensuring that children are healthy, brings happiness to me. This is because when their children fall sick they bring them to (us) for treatment and the child gets cured. I feel good about it.*
> *Respondent 2 Female Technology Arm*

At an organisational level, the environment created and maintained by the VHT programme had an apparent influence on the motivation of VHTs in a range of ways. When drugs and equipment were present they could be motivating as indeed could the promise of their delivery. In contrast, their absence appeared to result in a drop in motivation. Almost all VHT respondents discussed the availability of drugs and its impact. Otherwise VHTs did not indicate they were lacking motivation with the exception of those using 'motivation' as a euphemism for payment.

> *If I go to the health facility twice and there are no drugs, I become less motivated so at least these drugs should be supplied on time so that I can make my programme faster.*
> *Respondent 24 Male Community Arm*

While VHT respondents often emphasised that they were volunteers and had accepted that the role was without payment, there was an apparent belief among almost half of the interviewed VHTs that in the future they would be recognised and rewarded. The basis for this belief seemed to be that they worked very hard and if the Ministry of Health and even Malaria Consortium was aware then they would recognise this with goods, money or some other symbolic gesture of appreciation. This belief was variously presented as a perspective, motivator and cause for advocacy for VHT needs.

> *Like any other kind of work, we do this kind of work with hope that one day we shall fully benefit for example if you are a farmer, you just know that at a certain period of time, you will (be) harvesting*
> *Respondent 18 Male Control Arm*

Often requests were subtle and full of euphemisms. They also commonly alternated between general expressions of hope for recognition and more direct requests to the interviewer. It was sometimes challenging to distinguish requests for material reward from requests for symbolic recognition of value and worth. While it is plausible that material reward may be interpreted as a form of validation, an alternative interpretation, supported by the fieldworkers who conducted the interviews, was that requests for 'thanks' and to be 'thought of' were requests for payment of some kind.

> *At times when we are called for meetings, they tell us 'VHTs you are really hard working because even at the health facilities, children with fever are no longer frequenting it' meaning we are working…but again as we are working…please also think about us…(Opens eyes wide..)*
> *Respondent 24 Male Community Arm*

At the community level, almost all VHT respondents cited combinations of a sense of duty, obligation and commitment to the community as drivers of their work motivation. Seemingly linked to a sense of community altruism, and an ongoing drive to contribute to the improvement of community health, many VHT respondents described a sense of obligation to persist with VHT work despite challenges. There was a sense that having committed to be a VHT, despite the challenges and lack of payment, an obligation to the community made the position essential and they felt compelled to continue. Again, this is characteristic of a level of performance motivation that focuses beyond the task based prescriptions of the role.

> *We as VHTs we have a helping heart. We have always told them that our work stops at 5:00pm but you find that even after that time a parent comes begging for assistance. As a VHT, you cannot reject such a request. I provide the treatment that is why I said we VHTs we have a helping heart.*
> *Respondent 8 Female Control Arm*

Variations in the work motivation of VHT respondents by gender and intervention arm were not apparent. While VHTs seemed motivated by a range of influences at individual, family, organisational and community level it was not clear what they were specifically motivated to do. Motivation to perform was commonly articulated in terms of 'doing the work' and maintaining an effort. What they were motivated to do was indicated by passing references to task based performance and work ethic related references to extra role performance. The

next section examines whether VHTs considered work performance to be within their volitional control.

To what extent do VHTs perceive VHT work performance to be under their volitional control?

A strong finding of the analysis was that VHT respondents felt that their performance was within their control to the degree that they could secure a reliable drug supply. This cut across discussions of working conditions, health system support in the form of drug supply and, relatedly, community level esteem for VHTs according to VHT respondents of both genders and across intervention arms. While other elements such as lights, bicycles, phones and community support may catalyse their efforts, it was apparent VHTs felt a lack of drugs could derail them. In their presence, VHTs felt capable of effectively treating children and enjoyed elevated community standing. In their absence VHTs could not treat children, felt that they disappointed parents, and experienced reduced status in the community. These issues are explored in this section along with the multi-component strategies VHTs developed to maximise the possibility of securing drugs while engaging in activities that appeared aimed at promoting their usefulness and conscientiousness in their absence.

VHT respondents suggested their access to drugs was influenced by a range of factors at peer, community, supervisor and health system level. At times these influences were acknowledged to be beyond their control. At other times VHT respondents felt there were things they could do to increase availability such as travelling to the health centre to collect drugs, communicating with supervisors to understand whether drugs were in stock and sharing supplies with VHT peers.

> *…the truth of the matter, these drugs are really effective for example as soon as you realize that a child has got pneumonia, the baby breathing at a faster rate, you give them medication, and they improve. The same applies for zinc, in case the child has diarrhoea, so long as the care taker follows instructions and completes the dose, there is usually an improvement within 2 days so these days are really very important. Respondent 26 Female Control Arm*

When drugs were unavailable VHTs felt that children could experience poor health outcomes and community members would be displeased. While it was not apparent that VHTs would stop working there was nevertheless a sense that their capacity to provide services in the manner they and the community would like was inhibited.

We have taken almost six months. There are occasions when the community abuses us because we cannot provide the drugs which are finished. Sometimes parents come when they are very angry yet we do not have the drugs. So if you could sort these issues that I have mentioned.
Respondent 15 Female Technology Arm

The primary complicating factor in securing drugs was that VHTs felt that the time spent in their pursuit had to be balanced against assessments of whether time could be better spent in attempts to secure income. VHTs seemed to face an invidious choice between securing their livelihood through the pursuit of income generating work and securing drugs which were so critical to the effectiveness of their work treating children and the cooperation and respect this brought from community members.

… we would like to have those drugs that are frequently consumed, in demand to be constantly available so that people who were once giving us respect do not stop doing so … when these care takers bring children to you and you treat them and they get better, they begin respecting you … That is why when we call for these clubs, people are there so what is important is respect
Respondent 24 Male Community Arm

Compounding the difficulty of this time allocation decision, some VHTs noted that they had on occasions made the journey to the health facility only to find that drugs were not available. Other VHTs suggested that they did not have time to collect drugs even if they knew they were available.

I have got a lot of responsibilities so if drugs were brought to us, we would be able to save on that time …what we are only lacking is have drugs near us. The fact is that there are times when these drugs get finished and I spend more than 4 days without any thing to use and I fail to pick these drugs at times because of lack of time.
Respondent 28 Female Control Arm

VHT respondents also lived and worked at various distances from the health facility. Most explained that to collect drugs they needed to travel for several miles. This required them having the financial or physical means to do so, the latter most commonly through access to a maintained bicycle. These means were considered critical to their ability to perform and not all VHTs had access to them.

we appreciate government efforts of giving us bicycles but most of them are no longer functioning and they do not have spare parts even if you try to look for them ,you cannot get them so once a bicycle gets spoilt , you just keep it. My bicycle that I was given, I have just kept , I no longer use it, but now use my personal bicycle, the

one you found me riding … so those are the things we are requesting … at times when drugs are brought, they want us parish coordinators to take them to each VHT. So the truth of the matter is that in carrying these drugs, we suffer a lot where by there is nothing you would have got but for me all those things make me happy but may be only think of us get means of transport so that we can work.
Respondent 12 Male Community Arm

The other important action that VHTs evidently felt could support their goal of achieving a more reliable drug supply was advocacy as noted in earlier sections and demonstrated in the quote from Respondent 15 above. Often there was a sense of exasperation evident as stories of recounting the need for drugs to supervisors and VHT coordinators to no avail were related. This did not deter VHT respondents from emphatically requesting they be supplied with drugs in the interview encounter. There was a clear belief that action to address the challenge of sporadic supply would be taken at an organisational level if the need could be communicated effectively by the VHT collective. In this way VHTs demonstrated their belief that they could address the key barrier they identified to effectively performing in the VHT role if the needs of the collective were made clear.

We are only requesting malaria consortium to always supply drugs on time so that we can completely eradicate malaria, cough and diarrhoea among young children … And maybe I can also add on this, we have got coordinators who are supposed to pick and send our reports … I wonder where they get the reports they submit because some of them do not get them from us, so I think that is one of the main reason why drugs are not always supplied on time. To me, I think some of these coordinators make forged reports and that forces the health ministry to send drugs according to the time they wish and you end up as VHT without any drugs and referring the parent to the health facility so that makes it a challenge for the parent to move because of the distance to the health facility and that is when you hear that a child has died because of malaria.
Respondent 29 Male Technology Arm

The primary strategies used by VHTs to secure drugs involved advocacy and travelling to the health facility. Both strategies were commonplace and therefore it was apparent VHTs felt their effectiveness was, to a degree at least, within their control. What was not within their control was ensuring a supply of drugs at the health facility, having the current stock levels reliably communicated to them and always having the financial and physical means to travel to collect drugs. Given these variables and the likelihood of differing VHT assessments regarding time allocation to revenue generating activities and travelling to the health facility, perception of and actual control over drug supply is likely to vary between VHTs. The

seasonal demands of planting and harvesting crops are also likely to influence the ability of VHTs to travel at certain times of year.

The critical influence on VHT performance of drug supply and the means to secure it contrasted somewhat with a range of other tools and equipment identified as desirable by VHTs. While performance could be derailed through lack of drugs, it was felt by VHT respondents that it could be enhanced through having lights for working at night for instance, soap for maintaining a professional appearance, and phones for facilitating communication with peers and supervisors. The role of phones is explored further in a cross cutting results section below relating to the influence of the inSCALE interventions.

Do VHT respondents believe their performance as VHTs is effective and do they value the outcomes of this performance?

VHT respondents felt they were effective when it came to supporting the health of their community and, in particular, children when drugs were available. They valued their task based performance when treating and appropriately referring children. They also valued their extra role performance when they went beyond the requirements of the VHT role in their commitment to improving local child health. It was apparent that performing well as a VHT was a goal and that improving the health of children was considered a worthwhile and achievable outcome.

> *There are times when somebody can bring a child and finds when I am also not feeling well but because I know I am supposed to do that work, I am forced to work and dedicate my time to see that the child is treated … Now the community is less worried about diseases such as diarrhoea, once the child is sick, they just know that VHTs are there with these drugs.*
> *Respondent 28 Female Control Arm*

In terms of task-based performance, VHTs enjoyed the positive esteem they were held in when appropriately treating and referring children in their communities. This experience of their performance was considered of value and worth pursuing albeit contingent upon the availability of drugs. VHTs also valued their own competency from a personal development perspective. In this way, learning through their training and work experience was a valued outcome from their performance.

> *I am proud of my work as a VHT simply because I treat young children and this has given me skills and experience ever since I was trained.*
> *Respondent 1 Male Technology Arm*

VHTs commonly emphasised character attributes they considered essential for effective performance beyond task-based competencies. In so doing, they explained that the ability of VHTs to be both adaptable and conscientious were critical to the performance tasks they evidently took pride in performing. Examples of this were accepting that being available to patients during the night was part of being a VHT, maintaining a happy and positive demeanour in order to inspire community confidence, and being adaptable and resourceful enough to manage localised community health challenges as they appeared. They emphasised the sacrifices and difficulties that accompanied their work but also, commonly, explained that given the health of fellow community members was at stake, they felt they had no choice but to continue. Thus, VHTs commonly presented themselves as selfless servants of the people despite the obstacles and challenges.

> *Although it is difficult, I accepted to do the work and I feel good about it*
> *Respondent 20 Male Technology Arm*

> *…it is about sacrificing your time to do this kind of work because if I do not sacrifice my time, even the young children may not be helped because we do not get any profits from this kind of work that we do, it is basically sacrificing your time.*
> *Respondent 28 Female Control Arm*

Several VHT respondents also presented examples of where they had used their initiative to go beyond the requirements of the VHT role, seemingly with the aim of upholding the reputation of the VHT programme.

> *During referral, I also make sure that I accompany these parents to the health facility, I do this because I get worried that the parents may not reach up to the health facility. And secondly the parent may also go to the clinic and receive poor treatment so in the end blaming the government.*
> *Respondent 12 Male Community Arm*

By explaining the sacrifices and character attributes they felt were necessary to achieve improved community health, VHTs emphasised that they felt it was their holistic approach rather than task based proficiency that made effective VHT performance possible. This focus on *extra role* performance has also been noted in the previous sections related to social norms and motivating factors. This focus was common to male and female respondents as well as respondents across the different intervention arms. Several possible explanations for VHT focus on *extra role* performance are noted here and examined further in the discussion section. The first is that VHTs may feel that in explaining these challenges and priorities in the research interview they were more likely to receive drugs. The second is that supporting

community needs beyond the task prescriptions of the VHT role may be considered more conducive to the maintenance of community respect and standing in the face of a sporadic drug supply. The final explanation proffered is that perhaps VHTs feel this is the best way to address the health needs of children in their community given the twenty-four hour nature of the role and the various challenges identified. This is plausible given that VHT respondents clearly shared the VHT programme goal of improved community child health. They apparently felt this goal was more likely to be achieved through a holistic approach inclusive of but not limited to prescribed iCCM trained VHT tasks such as appropriate treatment.

6.4.2 The influence of the inSCALE interventions on VHT social identification and work motivation

The two interventions took different approaches; one, a technology supported approach utilising low cost mobile phones and the other, a community supported approach utilising participatory village health clubs. The influence of both on the relationship between VHT social identification and work motivation are presented here based on thematic coding of the testimony of the interviewed VHTs as described in the Methods section.

The Technology supported approach

The provision of a mobile phone as well as the activities of the Technology arm did appear to influence VHT notions of the importance and status of the role and connectedness to the health system. However it was also apparent that these benefits were experienced by VHTs in the other arms (i.e. Community and Control). Mobile phone ownership was high among VHTs across intervention areas and VHTs had a clear willingness to use their own phones to beneficial effect in the course of their VHT duties. Ownership and use of mobile phones engendered a sense of belonging and collective identity among VHTs regardless of VHT gender or whether phones had been supplied or were privately owned. While it appears the use of provided phones catalysed a sense of connection with the health system and identification with the VHT collective in the Technology Arm areas, the same influence was apparent in the other intervention areas. As a result, the activities of the technology Arm intervention appeared to amplify an effect that was already occurring.

> *Like for me I help in coordination with one of the health workers at the health unit on issues of pregnant women since I was given a mobile phone. So I use this phone to coordinate my activities as a VHT in the village.*
> *Respondent 25 Female Community Arm*

> *Sometimes I can be in the village and defeated with work. So what I do is call my*
> *fellow VHT to come and do the work together like doing home visits.*
> *Respondent 11 Female Community Arm*

The technology arm was designed to bring additional benefits through removing the cost of communications, providing personalised and timely feedback and more obvious signifiers of VHT role through colourful VHT branding. While these additional benefits were welcome to VHTs, and likely to have promoted greater identification, this influence was challenging to differentiate from similar benefits conferred by the use of VHTs' own phones. Specific elements of the Technology Arm intervention, such as personalising and tailoring messages to recipients' needs, did nevertheless appear to boost VHT confidence and belief in the importance and status of the VHT role.

> *Now, there was a time when I sent reports some time back before we got these*
> *internet interruptions, so after sending my report, I saw my name on the phone and*
> *I got shocked in finding out that even the ministry of health recognises me and they*
> *again send me a message reminding me of sending a report in case I did not send the*
> *previous moments but unfortunately there was network interruptions by then so that*
> *showed that the ministry of health now recognises us, it is no longer rumours.. but*
> *the truth.*
> *Respondent 1 Male Technology Arm*

For Respondent 1 the 'personalised' response to sending a report on the provided phone led to a sense of being part of the health system and having their contribution recognised. This was the intention of the intervention. Several VHT respondents in the technology intervention arm noted the benefits of the supplied phone in a manner indicative of cognitive, affective and evaluative identification. Respondent 30 was fairly typical of Technology Arm respondents in that the language chosen demonstrated cognitive classification as a VHT by referring to 'my fellow VHTs'. This respondent also indicated evaluative identification by recognising advantages conferred to the VHT collective by the Technology Arm intervention, in this instance the easy VHT peer communication enabled by the supplied mobile phone, which was cost free to the user.

> *Like the phone I have I use it for communication without any charge. So I can easily*
> *interact with my fellow VHTs quite so easily.*
> *Respondent 30 Male Technology Arm*

On other occasions respondents were more effusive in articulating their emotional response to the benefits brought by the phones and the communicative opportunities they provided.

> *The health workers at the health facility also talk to us and that makes me like my*
> *work as a VHT, they care for us.*
> *Respondent 1 Male Technology Arm*

More typical however was a simple explanation as to the increased capacity to perform as a VHT having a supplied phone brought to them, the CHW collective and the community.

> *Why I say that VHT work is good is that we have been able to get things that we used*
> *not to have before for example counting fast breathing using your phone, then*
> *communicating on the same phone freely with other VHTs you say 'now in my place,*
> *I do not have any medicines, do you have any in your village and you send me some',*
> *so communication has been made easier.*
> *Respondent 29 Male Technology Arm*

> *there were so many things that I used not to know but right now I know about them*
> *for example sending messages, how to call each other , they even gave us solar panels*
> *and taught us how to use them for charging*
> *Respondent 21 Female Technology Arm*

The Technology Arm intervention sought to provide a means for VHTs to receive peer support through the closed user groups. In so doing, it was proposed that a common identity would be developed. The peer interactions facilitated by the intervention were indeed considered to be beneficial to the performance and management of their role by VHT respondents in the Technology Arm.

> *Now let me tell you this, I am the parish coordinator, in case drugs have been supplied*
> *in this parish, I use my phone to inform other VHTs freely, I do not spend money on*
> *buying air time, so these VHTs keep on calling each other that drugs are now*
> *available.*
> *Respondent 16 Male Technology Arm*

However, the value placed on peer interaction was also evident among respondents in the other arms. For example, one Control Arm respondent noted the benefits of a parish level VHT group, which provided a forum where VHT support and knowledge sharing could take place but also where together VHTs could collaborate in the pursuit of goals beyond the VHT role.

> *We formed a group which we registered in the district. This group is called "NAME*
> *A[47] Parish Village Health Team," composed of VHTs recruited by Malaria Consortium*
> *… we instituted a practise of saving where the VHT members contribute membership*

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[47] The actual name of the parish has been changed to preserve the confidentiality of the respondent/s.

> *fees. This group usually convenes meetings every two weeks. During this meeting we make reviews of the activities of VHTs which takes about thirty minutes. We also share about some of the roles that VHTs perform. Where one of us has problems we guide each other on how it is done. We then proceed to discuss the aims of the group like encouraging members to save.*
> *Respondent 19 Male Control Arm*

This example emphasises the appreciation VHTs had for the benefits conferred by peer support; not just for VHT work but also for meeting broader needs of the VHT collective such as income generation. VHTs were evidently aware of the value of such peer interactions and actively sought them. While the Technology Arm may enable such opportunities to occur it was not the only means through which this could be achieved by VHTs. Indeed it appears that VHTs recognised the 'symbolic capital' conferred by the VHT role that could be leveraged for personal and collective benefit. In this instance status as a VHT has allowed them access to a group where funds are raised to be used at the group's discretion. Such opportunities may be an additional motivation for the performance activities prioritised by VHTs and explored in results section 1. It was nevertheless apparent that the drive of VHTs to meet and collaborate was independent of the communication benefits provided by mobile phones; whether personally owned or supplied by the programme.

The community supported approach

There were few specific mentions of Village Health Clubs by VHT respondents. This indicates that benefits of and indeed challenges relating to the VHCs were not considered by respondents to be the most important to emphasise. When VHT respondents did mention the VHCs they nevertheless recognised the benefits they brought to the community and to them. No difference in emphasis or experience was noted by gender.

> *These clubs help in carrying out prevention activities like clearing the bushes near homes and this reduces on the level* (of) *disease outbreak in the village. This makes me happy about the clubs because they support my work and community.*
> *Respondent 11 Female Community Arm*

It was also apparent that VHCs provided a forum for rendering the VHT social identity salient by virtue of the ready comparison to be made between VHTs and community members during their operation. The following quote illustrates this point through the respondent's use of 'we' to indicate the 'in-group', or socially identified collective of VHTs with which they categorised themselves, and 'them' to denote the comparison 'out-group', or community.

You find that every month we mobilise the community and we sensitise them that diarrhoea is caused by maybe drinking water so let us maybe try to avoid poor hygiene, those without latrines, we sensitise them on the importance of having one. So those are the clubs that we formed in the villages. These are the clubs, we sensitise in the community on the cause of different diseases so that people can be sensitised … You can even spend a week before getting a patient, in fact there was a month I spent without receiving any sick child and that showed we are really working, people are really learning.
Respondent 24 Male Community Arm

In this quote Respondent 24 recognises the value of VHCs as enabling forums for communicating and influencing community members in their VHT role. This respondent also describes what 'we' VHTs deliver to 'them' or community members. This indicates the catalysing role of the VHC in affirming VHT social identity through comparison with the community 'out group'. Nevertheless references to 'we' (denoting the VHT collective) and 'the community' or 'they' (denoting non-VHT community members) were common for instance across intervention areas. While it is plausible based on VHT interview data to conclude that the VHCs did promote social identification with the VHT collective, it was apparent the VHCs were not the only setting where this process took place. The VHCs appeared to render VHT social identity salient and contribute to social identification with the VHT collective but, as noted in the first results section, other settings also produced this effect.

While it appears likely that the VHCs promoted the value of the VHT role, VHT status and respect and community connectedness, VHT respondents did not explicitly indicate this. Instead, they suggested that these benefits were achieved across arms through a range of community interactions.

6.4.3   Results summary
The key findings from the results were that:

- VHT respondents strongly identify as VHTs and as members of the VHT collective. They generalised typical VHT attributes to themselves and other group members and demonstrated they valued and enjoyed VHT work.
- Many aspects of their working lives appeared to make VHT social identity salient for VHT respondents including interacting with community members.

- VHT respondents were passionate when advocating for what they felt the VHT collective needed and were clearly willing to exert effort on behalf of the group.

- While social norms and goals were generally more outcome than task related, the community and in particular child health performance outcomes identified were consistent with VHT programme aims. VHT respondents highlighted the importance of capacities that were above and beyond the official task requirements of the VHT role and, in so doing, emphasised the value they assigned to extra role performance.

- VHT respondents both reported being and appeared to be motivated. They saw value in their work based on their technical expertise but were motivated to perform above and beyond the specific tasks required by the VHT programme. VHTs prioritised these aspects during interviews. While task based motivation may have been implicit, the willingness to emphasise their motivation to engage in extra role performance activities may have been due to the belief it would help secure drugs, would gain and maintain community respect and that it was the best way to improve child health outcomes. Connections with and accountability to VHT peers, community members and supervisors were also important for VHT work motivation.

- VHT respondents felt the effectiveness of their performance was mediated by the availability of drugs, other equipment and levels of community support. Community level support was linked by VHT respondents to drug availability. When drugs were available VHTs believed they could effectively treat children and recognised they received elevated community status and support. The ability to secure drugs came at a material and time cost for VHTs which they weighed against the practical and reputational benefits.

- VHTs recognised that their performance effectiveness relied on providing a holistic response to community needs or extra role performance rather than exclusively task specific aptitudes. Drawing on social norms of being warm, generous and locally responsive, and resonating with motivating factors such as a sense of obligation to persist out of a sense of duty despite challenges (noted above), VHTs recognised their effectiveness relied on their work ethic, diligence and commitment to go the extra mile or to have a 'helping heart'.

- While the benefits of the Technology Arm intervention were recognised and valued by VHTs, the same benefits were conferred by private ownership of phones across intervention areas. For instance, phoning to check drug stocks and connecting with peers

and supervisors. Similarly, while the Village Health Clubs appeared to be a forum where VHT social identification was affirmed and the importance of the VHT role emphasised, it was apparent that this occurred during other interactions between VHTs and community members.

- Analysis of the Technology Arm intervention revealed that VHTs leverage the symbolic value of VHT status through peer interactions for collective and individual benefit. This occurred independently from the interventions and may contribute to the apparent VHT motivation to maintain their community standing through *extra role* performance activities in the absence of drugs.

- No notable gender differences in VHT testimony were found.

6.5 Discussion

This chapter aimed to explore the relationship between VHT social identification and work motivation, the influence on this relationship of the inSCALE interventions and the implications for VHT work performance. The results indicate that VHTs are motivated and identify as a collective. They also suggest that while the interventions were well received, they did not appear to improve on already high levels of motivation and social identification. This supports the quantitative findings presented in Chapters 4 and 5 and emphasises that the high levels of work motivation and social identification recorded by the measurement scales may be due to existent high levels rather than a lack of scale sensitivity. However, through the analytical lens of the Social Identity Approach and van Knippenberg et al's model of social identity, work motivation and performance, a more nuanced understanding of what VHTs are actually motivated to do was revealed (Van Knippenberg and Ellemers, 2003). This discussion section explores these findings in four sub-sections. These relate to:

1. The influence of the inSCALE interventions
2. The discovery that VHTs are already motivated and identify collectively
3. The actions VHTs are motivated to perform
4. The utility of drawing on the Social Identity Approach for the analysis

In the discussion I also propose a process model of VHT *extra role* and task based performance and a modification to van Knippenberg's (2003) model of social identity, work motivation and performance used in the analysis. Limitations of the methodological

approach used are discussed and the chapter concludes with a comment regarding the stated chapter aim.

6.5.1 The influence of the inSCALE interventions on VHT social identification and work motivation

The inSCALE interventions appeared to be well received. Any positive impact they had on VHT social identification and work motivation was difficult to detect because VHTs across the arms identified collectively and appeared to already be motivated. It may be the case that the interventions had an additive value but the data did not suggest major differences between intervention arms. Across the intervention areas VHTs found ways to collaborate collectively and act to meet the VHT collective's interests. This occurred both as a function of and alongside the benefits of the two interventions. VHTs used their own phones when none were supplied and interacted with community members both within and outside the VHCs.

The structure of the VHT programme, with multiple members in each community, may have increased identification of VHTs with the collective. For instance the results indicated that VHTs valued and were motivated by peer interaction. The interventions may have had a greater discernible impact had they been implemented in settings where CHWs are more isolated from peers.

6.5.2 VHTs are already motivated and identify collectively

The results presented in this chapter indicate that VHTs are motivated. This finding was also suggested by the results of the formative research conducted prior to inSCALE intervention development (see Chapter 3). Despite the indication from the formative research that VHTs were motivated, the inSCALE interventions were designed and implemented in the belief that this motivation could waver and, if so, the interventions may help maintain motivational levels. Post intervention, scores from the VHT work motivation measurement scale suggested that VHTs across the intervention areas were highly motivated (see Chapter 4). The formative research, measurement scale and associative interview data presented in this chapter all therefore indicate high levels of VHT motivation. Social desirability bias may play a role but as reported in this chapter and in previous chapters, specific methods were employed to avoid this eventuality and mitigate against its influence. Based on the evidence from the data collected it can be concluded that VHTs are highly motivated.

Other studies have also found high levels of CHW motivation. For instance, in Sierra Leone, a study exploring the impact on CHW motivation of a mobile phone based intervention that enabled peer communication found no significant difference between intervention and control on already high motivation levels (Vallières et al., 2016). In Uganda, high motivation has been found among VHTs despite the notably adverse impact of travel challenges and sporadic drug supply (Brunie et al., 2014) and the influence of community respect and the impact of the work setting has been identified (Mercader et al., 2014, Sanou et al., 2016). These studies do indicate variability in motivation between sites potentially influenced by levels of community respect that are seemingly contingent upon what the local community values in their VHT. For some it may be drug supply as found in this study and Brunie et al's (2014). For others it may be level of training and the perception of commitment to improving community and child health (Sanou et al., 2016). When interpreting the seemingly high levels of VHT motivation it is apparent that an understanding of the factors that influence community esteem for CHWs needs to be understood.

The results presented in this chapter also indicate that VHT respondents strongly identify as members of the VHT collective. VHT interactions with community members rendered this identity salient with VHTs willing to act in the VHT collective's interests and aiming to perform well and improve the health of local children. While some studies have referred to community health worker and health worker identity they do not draw on the social identity approach in their analysis. They tend instead to refer to identity as an important concept but provide few insights regarding the links between identity, motivation and performance. One exception was a qualitative study of South African CHWs which drew on 'role identity theory' (Mlotshwa et al., 2015). This study recommended greater recognition of the importance of CHW *extra role* performance activities. This is discussed in the next section.

6.5.3   The actions VHTs are motivated to perform

VHTs believe that their ability to perform is negatively impacted by unreliable drug supplies. They seem to compensate for a lack of drugs by focusing on maintaining community respect. They seek to achieve this in part by performing extra roles to achieve good health outcomes and in the belief that this will maximise their prospects of receiving drugs. There have commonly been calls to enable CHWs to perform by providing them with adequate supervision, drugs and incentives (Bhattacharyya et al., 2001, Glenton et al., 2010, Strachan et al., 2012, Perry and Crigler, 2013, Colvin, 2014). The results in this chapter suggest VHT

performance would be enabled by such efforts. In addition the results indicate that VHTs' *extra role* performance is important to community health and the sustainability of the programme when these supports are not available. This is important when scaled up CHW programmes are typically characterised by high rates of worker attrition (Sanou et al., 2016, Rahman et al., 2010). Understanding and valuing the role VHTs play in their communities is also consistent with calls for increased recognition of CHWs as community members who have a complex set of relationships and dependencies with fellow community members (Campbell and Scott, 2011, Kok et al., 2015a). It is in this context that the drive to perform *extra role* functions needs to be understood.

Extra role performance activities were linked by VHTs to the prospect of maintaining their community status and standing. The drive to sustain the positive status of the VHT collective is consistent with the motivation to maintain the positive distinctiveness of the group one identifies with suggested by social identity theory (Hornsey, 2008, Haslam et al., 2014, Van Knippenberg and Ellemers, 2003). The social identity approach suggests that socially identified group members that do not feel that their group identity is changeable (i.e. VHTs cannot readily become paid health workers due to financial and educational constraints) will be motivated to improve the *positive distinctiveness* of their group (Turner and Reynolds, 2010). In addition to presenting the VHT collective in a positive light, the community status associated with *extra role* performance conferred benefits. VHTs felt that carrying out these activities gave them some leverage when seeking to secure drugs through advocacy. They also recognised that being a VHT enabled them access to networking opportunities that could bring material reward. These conclusions resonate with findings from studies in Uganda, Tanzania and South Africa.

1. In Eastern Uganda Kyaddondo and Whyte found that health workers were motivated to draw on social and professional networks to maintain positive professional identity as well as opportunities for income generation in the context of uncertain pay and conditions brought about by health system decentralisation, (Kyaddondo and Whyte, 2003). While a source of pride and positive identity, Kyaddondo and Whyte's study found that being a health worker came with the associated responsibility of providing for less able family members; both financially and through access to drugs. Maintenance of positive community regard was considered crucial to this end.

2. In a study of Tanzanian health workers Gross et al (Gross et al., 2012) drew on the theoretical work of Pierre Bourdieu who proposed that different forms of capital such as

symbolic, social, cultural and financial could be exchanged (Bourdieu, 1986). Based on a case study methodology, Gross et al (2012) found that in conditions where the scarcity of one or more forms of capital acted as a constraint to health worker actions, remaining capital resources could be leveraged to maintain effectiveness. The principle example provided was the ability of health workers to mobilise community contacts (social capital) and their status (symbolic capital) to access drug stocks, in the face of poor supply. Gross et al (2012) referred to this as 'workhood'.

3. In a study of South African CHWs Mlotshwa et al (2015) found that CHWs at different times felt part of the CHW community and the wider community while at others like a *broker* between the community and health system. While the authors did not draw on the social identity approach in their analysis they did suggest that being a *broker* 'involved being able to confront an interrelated set of material and other challenges in getting the job done' and that when this role was adequately encouraged and supported CHWs could be effective (Mlotshwa et al., 2015 p.7). Here Mlotshwa et al (2015) are referring to *extra role* performance rather than the task based performance that is more commonly cited as the reason for providing support in the form of supervision, training and incentives (Bhattacharyya et al., 2001, Haines et al., 2007, Perry and Zulliger, 2012, Perry et al., 2014).

It was clear that VHTs valued their ability to go above and beyond the mainly task based prescriptions of their role. For instance, while the Ugandan Ministry of Health Guidelines for iCCM trained VHTs suggest that VHTs should work with the community to collect drugs, there is no mention of being on call through the night for sick children, paying for their own transport to collect drugs or the need to be conscientious or patient (MoH_Uganda, 2010a). Adopting Gross et al's (2012) analytical approach, VHTs appeared to be motivated to maintain their status and standing as VHTs (symbolic capital) for the weight it lent them when advocating for drugs through contacts (social capital) and for the opportunities it provided them to generate income (financial capital). Given the livelihood benefits this afforded it may also be interpreted as a *survival strategy*. The results presented in this chapter support Mlotshwa et al's (2015) call for greater recognition of the value and importance of *extra role* performance.

A process model of VHT *extra role* and *task based* performance motivation

It is argued above that *extra role* performance can be seen as a logical response by VHTs to an uncertain drug supply and even a *survival strategy*. It is clear that VHTs had a slightly different concept of what VHT role effectiveness entailed in comparison with the VHT programme. Figure 6.2 contains a simple process model of VHT *extra role* and *task based* performance motivation developed based on this conceptual divergence and other results presented in this chapter. The key processes reflected in the model are as follows:

1. When drugs are available VHTs are motivated to undertake *task based* performance activities leading to the appropriate treatment of children and *role effectiveness* as *defined by the VHT programme*.

2. When drugs are unavailable, VHTs are motivated to undertake *extra role performance* activities, characterised by community responsiveness and flexibility, leading to a more holistic notion of *role effectiveness* as *defined by VHTs*.

3. By maintaining their effectiveness in the absence of drugs, albeit partially, VHTs felt they retained the possibility of being supplied with drugs through their active advocacy. This is reflected by the arrow linking *extra role performance motivation* back to *drug supply*.

4. While VHTs acknowledged the importance of drugs for their effectiveness they also recognised the importance of an alternative means of maintaining their community *status* in the absence of drugs. This is represented by the arrow connecting *task based performance motivation* with both types of VHT role *effectiveness*.
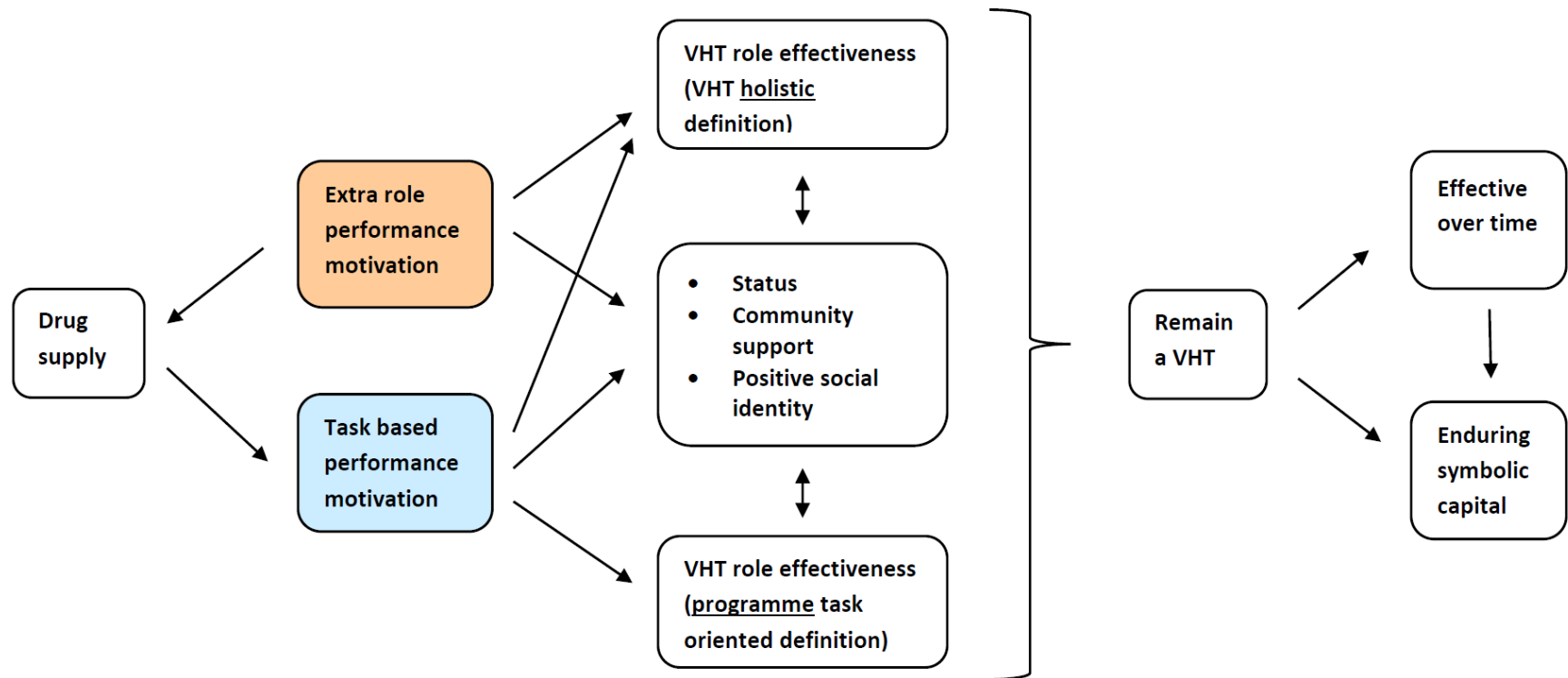
Figure 6.2: A process model of VHT *extra role* and *task based* performance motivation

NB: Performance motivation in the face of unreliable drug supply shaded orange, additional performance motivation when drugs available shaded blue

5. Both holistically defined and programme task oriented role effectiveness were considered by VHTs to help them maintain their VHT *status, community support and positive social identity*. Status, community support and positive social identity also improved both types of *effectiveness* through positive community regard and cooperation. This is reflected by two-way arrows linking both types of effectiveness with *status*.

6. Both types of role effectiveness could also lead to exposure to the benefits VHTs explained were available to them due their VHT title and status. When drugs were unavailable these benefits could only come by virtue of *holistically defined role effectiveness*.

6.5.4 The utility of drawing on the Social Identity Approach for the analysis

The reason for using Van Knippenberg et al's (2003) model of social identity, work motivation and performance was to try and better understand the contextual drivers of VHT motivation and performance. This has been achieved. While the inSCALE interventions, designed based on the Social Identity Approach, did not have an impact this appeared to be because VHTs from across intervention areas already identified collectively and were motivated. What the analytical lens of Van Knippenberg et al's model instead enabled was a means through which to understand the psychological process underlying VHT motivation to undertake extra role performance activities.

Drawing on the social identity approach and van Knippenberg's model has enabled the recognition that VHTs are focused on social change in terms of progression for themselves and the VHT collective with which they identify. They wish to be respected while acknowledging this outcome is to be most effectively achieved through treating children. While they are motivated to work, the analysis model used has indicated specifically what they are motivated to do. These insights suggest reconsideration of what is understood by VHT, and potentially CHW work motivation and performance is warranted. This is a topic explored in the final dissertation chapter.

A proposed modification to van Knippenberg's (2003) model of social identity, work motivation and performance

The results in this chapter indicate that an appreciation of the impact of performance is an important addition to the model proposed by van Knippenberg et al (2003). Van Knippenberg et al's model is unidirectional in that it proposes a linear psychological process of social identification leading to work performance *via* several components and component moderators (Van Knippenberg and Ellemers, 2003). Yet the results presented in this chapter indicate that VHTs' experience of their performance outcomes had a bearing on the social norm development (a key component moderator in the model) and subsequent behaviours of the socially identified VHT collective. For instance, uncertainty around volitional control over performance outcomes led to the development of VHT social norms around the importance of *extra role* performance (e.g. being available to respond at all times of the day and night). The proposed model therefore inadequately accounts for the motivational drivers of the interviewed VHTs. Figure 6.3 proposes a slight modification to van Knippenberg's et al's (2003) model to reflect this finding. An arrow now connects *performance and experience of performance outcomes* with *perception of group goals and norms*. This arrow indicates an ongoing process where work motivation of socially identified workers is informed by the anticipated and actual outcomes of performance. In the context of work motivation theory, this addition is supported by *outcome expectancy* theory discussed in Chapter 2.
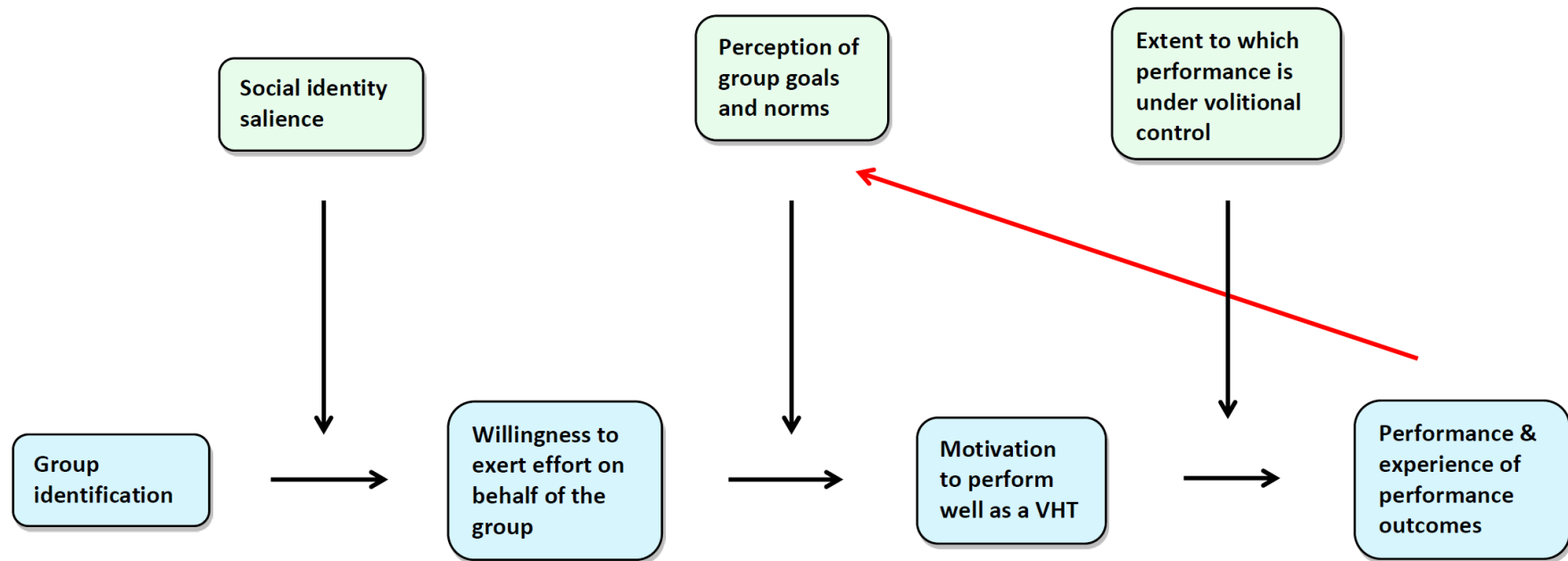
Figure 6.3: A moderated process model of social identity, work motivation and performance highlighting the link between experience of performance outcomes and perception of group goals and norms
(Adapted from van Knippenberg, 2001 and van Knippenberg and Ellemers, 2003).
NB: Key components shaded blue and moderators of process shaded green

Limitations of the approach used

There were some limitations to the study. The study design appeared to be successful in countering the challenge of social desirability bias discussed in the *rationale for approach* section. The methodology did however prove challenging for one of the fieldworkers who had trouble accurately delivering instructions to VHT respondents from the provided script. Instead of saying 'we are interested in what you associate with being a VHT' the fieldworker often said 'what associates you with being a VHT' and 'what do you associate with VHTs in your village'. This invited respondents to think of other VHTs' experiences rather than their own. This occurrence was captured during the daily debriefs and was addressed though may have prevented respondents from reflecting on their own experiences in greater depth. The impact of this challenge may have been amplified by the multi-lingual operational setting despite the strategies, such as monitoring and daily debriefs, employed to counteract this possibility.

The associative interviews deliberately encouraged VHTs to prioritise the information they wished to communicate. As a result, due to a lack of emphasis on their task related performance activities, a more nuanced analysis of the technical performance of VHT work was beyond the scope of the analysis. VHTs tended to talk about flexibility, being available and working hard. There was very little VHT interview content related to diagnostic accuracy or other programmatically understood indicators of appropriate performance. Therefore assessing whether high performance was a social norm or goal was relative to the definition of high performance. The answer was 'yes' for work ethic and performance outcomes (i.e. healthy children), but 'difficult to say' for diagnostic, treatment and referral performance quality. While utilising the associative interview methodology has generated useful insights with regard to VHT identification and motivation, findings related to VHT inclination to perform specific VHT actions required by the iCCM programme most likely required these to be specified in the interview guide. The same is also true for important, gender-based differences that, as noted in the review of the literature (see Chapter 2), may have had a bearing on VHT motivation and performance. While no notable gender-based differences were found in the data analysis, such differences may have been discerned had they been explicitly explored with respondents (Morgan et al., 2016). While the analysis sought to identify divergent views, few were found.

Despite these challenges the data set produced was rich.

6.6 Conclusion

The results presented in this chapter suggest that VHTs socially identify with the VHT collective and that their work motivation is, at least in part, informed by maintaining a positive collective VHT identity. While the inSCALE interventions appeared to support identification with the VHT collective and VHT work motivation, this process also appeared to be enabled by other aspects of VHT work life. A research focus on the relationship between social identification with the VHT collective and work motivation through the analytical lens of the social identity approach has nevertheless yielded useful insights. Most prominent among these is the finding that VHTs are motivated to engage in *extra role* performance activities in order to maintain their status and levels of community respect in the face of uncertain drug supplies. They do this in the apparent belief that it will improve their chances of receiving drugs as well as benefitting from opportunities afforded to those with VHT status. It was this aspect of their professional lives that VHTs most sought to discuss and emphasise during the associative interviews.

The importance of *extra role* performance motivation to VHTs has potential implications for future VHT work motivation strategies and possibly those related to other cadres of voluntary community health workers. This is particularly so given the resonance of these findings with those of other studies with CHWs discussed in this chapter. These implications are discussed in Chapter 7.

7. Discussion: review of PhD objectives and recommendations for future CHW motivation research and programmes

7.1. Introduction

This final PhD Chapter will review the extent to which the PhD has achieved its aims of understanding the work motivation of voluntary Ugandan VHTs, and the utility of the SIA for the task. A summary of the key findings and conclusions from the PhD are presented in Table 7.1 as they relate to each of the first three PhD objectives. The most important findings from the PHD are then reviewed with reference to the overarching PhD aims. The implications of the findings for those seeking to improve the performance of community health workers through a focus on their work motivation are also discussed (i.e. the fourth and final PhD objective). Limitations of the PhD in terms of design and scope are presented before the Chapter and PhD concludes with reflections on future research and programme directions.

7.2. Meeting the PhD objectives

Table 7.1: PhD objectives – summary of key results and conclusions

Objectives and key results:	Chapter
1. Develop two interventions that aim to improve the work motivation of Ugandan VHTs	
Two interventions aiming to increase VHT work motivation were designed based on formative research (FR) and behavioural theory including the social identity approach (SIA). • The FR findings indicated that VHTs want to: have the tools, support and information to do the job, feel part of the health system and community, improve local health and achieve high status and appreciation in their community • The review of behavioural theory and the SIA indicated that VHTs who 'identify' with the collective will be motivated to act in the perceived interests of that collective. If the interests of the VHT collective are consistent with the aims of the VHT programme it is likely to be due to programme aims being perceived as achievable and meeting both individual and collective VHT needs Based on FR findings and theoretical perspectives: • A community-supported intervention was considered likely to be effective through creating a VHT facilitated community level forum that: enabled VHTs to receive community feedback and, focus on locally relevant and negotiated activities prioritised by community members. In so doing it sought to promote a sense of connectedness and closeness between VHTs and their community by promoting the value VHTs add to communities • A technology-supported intervention was considered likely to be effective through providing programme branded mobile phones that enabled VHTs to communicate easily with peers and supervisors, receive motivational and performance related *SMS*, and send and receive programme critical information such as reporting stock-outs and receiving contextually appropriate performance feedback. In so doing it sought to convey the value of VHTs and the esteem in which VHTs are held by the health system while reinforcing VHT health system connectedness The interventions endeavoured, through different mechanisms, to create opportunities for VHT aspirations, as understood through the FR, to be realised. It was anticipated that a sense of the value of the VHT identity would become apparent to VHTs as a result and lead to VHT motivation to maintain this identity and enhance the positive esteem in which the VHT collective is held. Chapter 1 concluded by suggesting that if the interventions are found to improve VHT work motivation, a case for VHT motivation strategies, and CHW motivation strategies more broadly, focusing on meeting the needs of socially identified CHW collectives may be made. This may represent a relatively simple complement to more traditional, incentive focused approaches.	3
Objective achieved: NB: See Tables 3.7 and 3.8 for details of the intervention design features predicted to positively influence VHT motivation	
2.1 Develop a valid, reliable and practical VHT work motivation measurement scale	
In Chapter 4 the development and validation process for the <u>VHT work motivation measurement scale</u> was presented.	4

- The scale composition was based on existing scales used to measure motivation of paid health workers and the results of formative research conducted with VHTs. This approach provided reassurance regarding scale content validity
- Multiple motivational domains were included in the scale and were proposed to contribute to internal (examples of typical domains; *job satisfaction*, *self-efficacy* and *outcome expectancy*) and environmental (examples of typical domains; *resource availability*, *management and supervision support* and *role security*) influences on VHT work motivation
- The scale development approach was consistent with those of previous approaches to scale development adopted in low income settings
- Qualitative, cognitive interviews provided contextually specific insight that enabled modifications to scale item wording that improved construct validity before the scale was used in the inSCALE VHT endline survey

Despite the approach taken, there were three important challenges to concluding the VHT work motivation measurement scale was valid:

1. The predicted two factor structure (i.e. individual and environmental motivation) was not found during factor analysis tests. Instead scores from the seventeen item scale mapped onto three factors: *general motivation*, *retention in role* and *reward for effort.* This factor structure resonated with the qualitative findings presented in Chapter 6
2. VHTs recorded uniformly high scores on the scale regardless of whether they were exposed to influences proposed to impact on their motivation such as drug supply or inSCALE intervention area. The most plausible explanation was the already high levels of motivation among the VHT population but it is also possible that the scale lacks sensitivity or results were influenced by social desirability bias. This result also raised the question of whether work motivation is an appropriate focus when seeking to predict or influence improved VHT work performance
3. Five different modes of estimating VHT work motivation were used. Assessments of criterion validity were challenging to make for two reasons:
   a. High motivation scores were recorded that changed little by mode of scoring or by comparison variables. This made assessments of concurrent, predictive and discriminant validity difficult. The scoring mode selected used factor loadingss derived from the factor analysis to weight scores. This mode of scoring was consistent with that used previously in the development of work motivation scales
   b. It was not possible to adequately determine the scale's convergent validity due to the lack of a 'gold standard' scale to use to calculate a comparison motivation variable
- The VHT work motivation measurement scale was found to be reliable according to conventionally accepted measures but the recommendation was made that it be contextually adapted before application to other CHW settings. This should include the incorporation of locally derived motivation items based on formative, qualitative data in accordance with the process adopted for the VHT work motivation survey
- Chapter 4 concluded that many of the results suggest the VHT work motivation survey was valid, reliable and practical but further studies are recommended to confirm scale sensitivity and the three factor structure

Objective achieved with important caveats: further studies are recommended to assess the VHT work motivation measurement scale's construct and criterion validity

2.2 Develop a valid, reliable and practical VHT social identification measurement scale

In Chapter 5 the development and validation process for the VHT social identification measurement scale was presented. | 5

- A four-item social identification measurement scale was adapted for use with Ugandan volunteer VHTs. The scale was selected as it incorporated the key aspects of social identification specified by the SIA, namely *cognitive*, *affective* and *evaluative* identification. A single rather than multi-dimensional scale was adopted because social identification was under enquiry rather than sub-components of the construct. Basing the VHT social identification measurement scale on previous work lent credibility to claims of scale content validity
- Qualitative, cognitive interviews were used to refine item wording and descriptions of VHT identity and thus construct validity ahead of finalisation of the scale version used in the inSCALE VHT endline survey. The two main issues identified were:
  1. The word 'identify' was not universally understood as intended. Two alternatives, 'relate' and 'feel connected' were added as alternative wordings to the first item of the scale. This made a 6 item scale battery
  2. Two identity descriptions, identification with the *VHT programme* and with the other members of their local village health team were found to be qualitatively meaningful and distinguishable to VHTs. Two batteries of scale items, one for each identity, were incorporated into the final version as a result. This made a twelve item measurement scale
- Exploratory factor analysis was conducted on the scores generated from the scale items. The analysis revealed that:
  1. Including the first item referring to 'identify' led to greater internal consistency of the four item scale than when including either of the alternatively worded first item options. There was also no meaningful distinction between the two identities. As a result, a four item scale using the word 'identify' and referring to 'VHT programme' identity was used to estimate VHT social identification scores
  2. The first scale item, proposed to be indicative of social identification as a homogenous construct, was found to be valid for this purpose. This item could potentially be used as a standalone measure of social identification when survey space is limited
- Measures of criterion validity indicated scale validity with strong positive correlations recorded, as predicted, between VHT social identification and work motivation as well as status and respect and job satisfaction. The predictive validity of the VHT social identification measurement scale was supported by the statistically significant correlation with both intention to leave variables. There was no notable change in social identification across intervention areas
- The VHT social identification scale was found to be internally consistent producing a Cronbach's alpha score in the 'acceptable' range. Tests for clustering and fieldworker effects indicate that these variables should be controlled for
- The VHT social identification scale appears to be a reliable measure of identification with VHT programme social identity
- Chapter 5 concluded that contextual adaptation of the VHT social identification measurement scale is recommended before use with other CHW respondent groups but it would appear that the four item - and indeed single item - VHT social identification measurement scale could be reliably and validly deployed

Objective achieved: When using the social identification scale with other, CHW respondent groups, it is recommended that qualitative studies be undertaken to explore the locally nuanced relationship between social identification and variables of interest

3. Explore and explain the nature of the relationship between VHT social identification and work motivation, the influence (if any) of the interventions on this relationship, and the implications for VHT work performance

	5 & 6

In Chapter 5 the relationship between scores generated from the validated VHT work motivation and social identification measurement scales was assessed through the calculation of correlation co-efficients. These calculations revealed:

- VHT work motivation and social identification were strongly, positively and statistically significantly correlated (p < .001) (see Table 5.12).
- Correlation does not imply causality. The relationship between the two constructs is proposed to be dynamic with each having an influence on the other over time (van Dick and Wagner, 2002, Turner and Reynolds, 2010). Understanding the nuances of the relationship is necessary in order to determine whether social identification is a useful complement to work motivation based programming for improving VHT and indeed CHW performance.

In Chapter 6 qualitative associative interviews with VHTs were utilised to explore the nature of the relationship in more detail. The key results were:

Re: What VHTs were motivated to do

- VHTs socially identify with the VHT collective and appear motivated and passionate about pursuing what they believe to be in the collective's needs and interests
- Principle among these perceived needs and interests was the maintenance of VHT community status and standing. The two key ways in which VHTs felt this could be achieved were through securing drugs and performing above and beyond what was technically required by the VHT programme in the absence of drugs
- The symbolic value of status as a VHT could be leveraged by VHTs for personal and collective gain. This appeared to motivate VHTs to maintain their VHT role status, potentially more so than their motivation to perform as a VHT as defined by the VHT programme
- These results indicate that VHTs are motivated but what they are motivated to do includes both performance as defined by the VHT programme and performance as colloquially understood by VHTs. While these overlap, the latter includes responsive actions at the behest of community members. These actions are not specified in the VHT programme guidelines but are viewed by VHTs as essential to their role credibility and continuity; their principle concern. See *extra role performance* section below

The influence of the inSCALE interventions

- Any positive impact the interventions had on VHT social identification and work motivation was difficult to detect because VHTs across the arms identified collectively and appeared to be already motivated. The data (quantitative Chapters 4 and 5 and qualitative Chapter 6) did not suggest major differences between intervention arms
- The interventions were acceptable and appeared to engage and motivate VHTs while rendering their VHT identity salient. Identity salience was also seemingly achieved by other, pre-existing circumstances such as VHT use of their own phones and locally initiated public gatherings across all intervention areas. Very little difference in VHT work motivation and social identification scores estimated using the respective measurement scales was found

The important role played by drug supply

- Community level support was linked by VHTs to their effectiveness which they perceived to be contingent upon drug supply. VHTs also believed the community felt their effectiveness was mediated by the availability of drugs

- VHTs felt they could perform well when drugs were available but securing them took time and effort with a decision required as to whether to spend this time instead on revenue generating activities or earning community esteem through *extra role* performance activities

Extra role performance

- Social norms indicated that actions consistent with the goals of the VHT programme were valued by VHTs and VHTs reported being motivated. Additional actions considered necessary by VHTs for effective performance – termed *extra role performance*– were found to be equally valued
- *Extra role performance* actions were typically not specified in the VHT programme role description and were characterised by community responsiveness and flexibility with time management
- Three possible motives were identified for VHT emphasis on the importance of *extra role performance* activities. The belief it:
  1. Would help secure a more reliable supply of drugs
  2. Would assist in attaining and maintaining community respect both through securing drugs and being responsive to community needs
  3. Was the most effective way in which to improve local child health outcomes in the face of an unreliable drug supply
- Connections with and accountability to VHT peers, community members and supervisors was also important for VHT work motivation

An *extra role* performance model

- A process model of VHT *extra role* and *task based* performance motivation was proposed. The model demonstrates what VHTs who identify with the collective are motivated to do in the absence of a reliable drug supply according to the analysed qualitative data (Figure 6.2)

A proposed amendment to Van Knippenberg et al's (2003) model

- An addition to the analysis model used in Chapter 6 (Van Knippenberg et al., 2003) was proposed to account for how VHT experience of their performance informs the ongoing development of VHT behavioural norms. The principle example was the uncertainty regarding VHT control over their performance effectiveness (due to sporadic drug supply) which led to the development of social norms related to the importance of *extra role* performance activities (Figure 6.3).

Objective achieved: Drawing on the SIA and van Knippenberg et al's model (2003) has enabled the recognition that VHTs are focused on social change in terms of improving their own and the VHT collective's quality of life and material circumstances. The probability of such social change is enhanced, in VHT's view, when they are respected. VHTs feel respect can be gained most effectively through treating children when drugs are available and being responsive to the holistic needs of the community through their *extra role behaviour* when they are not

4. Reflect upon the implications of the data generated in the PhD for those seeking to improve the performance of community health workers through a focus on their work motivation

The summary of key results and conclusions against the PhD objectives presented in this Table have implications for those seeking to understand and improve the performance of community health workers through a focus on their work motivation. These are discussed in this Chapter | 7

7.3. What influences the motivation to work of Ugandan VHTs?

The primary aim of this PhD was to understand what influences the motivation to work of voluntary village health team members in Uganda. Based on the research evidence produced through the PhD, it can be concluded that VHTs were motivated to work in a manner generally consistent with VHT programme goals. The drivers of this motivation appear to be the perceived benefits their VHT role would bring to them, their families, their communities and the VHT collective. For instance, altruism emerged consistently as a motivational driver in both the formative research (Chapter 3) and from the associative interviews (Chapter 6). The achievement of altruistic goals was considered by VHTs to be highly related to their effectiveness. VHTs viewed their effectiveness as largely contingent upon their status and standing in the community which they attributed, in large part, to the reliable supply of support and resources (most commonly in the form of drugs). As a result, VHTs also consistently appeared motivated to achieve improved status, strong connections with the health system, and adequate and reliable supplies of drugs.

What drives VHT motivation and what VHTs were motivated to do was found to be more nuanced and complex than has largely been presented in the academic literature to date. The reason for this interpretation is that, while several studies have recognised how critical the reliable supply of drugs, community standing and respect are to VHTs (Ludwick et al., 2014, Sanou et al., 2016, Brunie et al., 2014), few have linked this importance to VHT drive for personal, family, community and collective VHT benefit. An exception is the work of Banek et al (2015) whose study of VHTs in Tororo district, in Eastern Uganda found that they were motivated by becoming someone of standing in their community and saw this achievement as contributing to their social mobility (Banek et al., 2015). Banek et al's findings, and the findings of this PhD, echo those of studies of CHWs outside Uganda that suggest, in conditions of poverty, the motivation to *be* a CHW may be led, at least in part, by the potential to materially benefit from attaining and maintaining the CHW role (Banek et al., 2015, Maes and Kalofonos, 2013, Whyte et al., 2013, Mlotshwa et al., 2015). Banek et al (2015) use the term 'career volunteers' (p. 458) to describe these workers. This is an important finding because motivation to be a CHW may not always be compatible with performing as a CHW. If the primary motivation is to retain CHW status for the range of benefits this can bring personally as well as for one's family and community, then research into CHW performance motivation must be seen through this lens. The focus of enquiry should be answering the question of how much performance, or performance of what type

or quality, is considered by CHWs to be sufficient to maintain their role status? Importantly for programme designers, consideration should also be given to the type of CHW performance and performance focus that is acceptable to CHWs and will be supported.

The VHT work motivation measurement scale developed and validated within this PhD (see Chapter 4) indicated high levels of work motivation across VHT respondent groups. Qualitative data collected through the associative interview methodology also explored VHT work motivation (see Chapter 6). The results, as discussed in the previous paragraph, indicate that the principle driver of VHT work motivation was a desire to maintain their role and role status for the perceived benefits it could lead to. While this status could be achieved through effective work as a VHT when a steady supply of drugs was available, without such supply VHTs reported pursuing alternative strategies. These strategies were based on being responsive to the varied and locally specific needs of the community to which they belonged and felt responsible; so termed *extra role* performance (e.g. being on call through the night). While status and, relatedly, the possibility of a future benefit could be maintained through *extra role* performance, a cost in terms of both time and resources was often incurred. Reward for effort, or the value of investing their time, did seem, as a result, to be a major influence on VHT work motivation. This appears to confirm the latent influence on work motivation of *recognition* and *reward for effort* discovered in the VHT work motivation measurement scale development process presented in Chapter 4.

That VHTs appear to be motivated principally to perform *extra role* performance activities in the face of uncertainty over drug supply raises questions with regard to current understandings of VHT motivation. Specifically, the assumption that CHW motivation is a constraint to the effectiveness of scaled up, CHW led health programmes (Pallas et al., 2013, Walker et al., 2013) appears to warrant revision in light of these results. According to the results of this PhD, it may be the manner in which work motivation is being considered that is at issue rather than a lack of this latent influence on VHT performance. VHTs were found to be motivated to perform in a more holistic, *extra role* manner when a lack of performance motivation in the literature appears to assume *task based* performance motivation. Given that for this cadre of iCCM trained VHTs, task based performance appears to be entirely contingent upon the reliable supply of drugs, blaming a lack of motivation for poor task based performance would appear to be a case of looking in the wrong place for an explanation.

The presented results indicate that across inSCALE intervention areas VHTs identify collectively, have adopted collective goals as self-goals, believe that *extra role* performance is critical to meeting both the VHT collective's needs and role performance, and are already motivated to perform in this way. Based on these results, the links between VHT work motivation and work performance need to be more specifically articulated in order to justify continued calls for the development of effective CHW motivation strategies in response to task based performance levels that are below expectations. In addition, a clear distinction between *extra role* and *task based* performance is required when considering CHW performance motivation.

7.4. The utility of the social identity approach as a theory for understanding and influencing VHT motivation

A secondary aim of the PhD was to explore whether the Social Identity Approach had the potential to inform an understanding of the work motivation of voluntary Ugandan VHTs. Adopting a VHT work motivation perspective informed by the SIA has yielded interesting and potentially useful results. This utility has already been discussed in Chapter 6 but key reflections are expanded upon here.

Interventions were designed based on the SIA informed premise that a socially identifying VHT would be motivated to maintain the positive esteem in which the VHT collective was held, that they would do this by adopting typical behaviours they felt supported this goal, and that these behaviours could be suggested through the interventions (see Chapter 3). A VHT social identification measurement scale was developed based on the SIA (see Chapter 5). In Chapter 6 a social identity model of work motivation and performance developed by Van Knippenberg and colleagues (2001 and 2003) was drawn on to analyse qualitative data generated from associative interviews with Ugandan VHTs (see Figure 3.1). This qualitative analysis led to a recommended addition to Van Knippenberg et al's model (2003) highlighting the link between experience of CHW performance outcomes and perception of group goals and norms (see Figure 6.3).The key insights from these varied applications of the SIA are captured in Table 7.1.

The SIA has informed understanding of what VHTs are motivated to do and why. Other studies have recognised that in conditions of poverty and limited resources, symbolic value of one's status may be leveraged to secure valued goods or less tangible benefits (Gross et

al., 2012). This work was informed by Bourdieu's notions of the 'forms of capital' where currency in the form of symbolic, social or even cultural capital may be transferred and leveraged for material advantage or capital of different types (Bourdieu, 1986). The research findings presented in this PhD appear to demonstrate how VHTs seek to maintain and leverage their symbolic capital. In conditions where drug supply is uncertain, VHTs are motivated to take the actions that maintain positive VHT social identity and, relatedly, their status and standing in the community. They felt this would improve the likelihood of receiving drugs in future, a key source of community esteem, of receiving in-kind opportunities through positive community relationships, and importantly, being more effective as a community health worker in the absence of drugs. That these actions or *extra role* behaviours were largely consistent with the spirit of the VHT programme, while not always specified as part of the VHT role, might be considered fortunate (MoH_Uganda, 2010a). VHTs cared for the health of their communities and appeared pleased they could play a positive role in this regard. Achievement of this altruistic aim appeared to be aided by their own level of positive community standing as well as to help in the attainment of this status.

Increased community standing and agency attained by virtue of being a VHT explains the drive to attain and maintain VHT identity according to the SIA. The late John Turner's work on the nature of power appears relevant here (Turner, 2005). Turner emphasised the social power and influence conferred by group membership (Turner and Reynolds, 2010, Haslam et al., 2012, Turner, 2005), which is particularly apparent for those living in conditions of relative deprivation (Haslam et al., 2012). He argued that power is not so much derived from the control of resources leading to influence and the formation of groups, but instead that group formation produces influence, influence is the basis of power, and power leads to the control of resources. In conditions of poverty, VHTs felt they could secure better outcomes for themselves, their families and their community by virtue of their social identity as VHTs and the potential for influence this conferred. They appeared highly motivated to maintain this status. The collective agency VHTs apparently felt and articulated in the associative interviews (Chapter 6), appears to bear out Turner's conceptualisation of power as both an outcome of collective identification and enticement to identify collectively.

Further work is required in other settings to probe the theoretical utility of the SIA for understanding the work-based motivational drivers of community health workers. Such examination should critically consider alternative explanatory frameworks. While the case is

made here for the suitability of the SIA for explaining the relationship between VHT work motivation, identity and performance, and specifically the factors that may influence this, there are alternative approaches. For instance, conceptualising VHT drivers as the pursuit of different forms of capital as per Bourdieu (1986) or, 'survival strategies' (Kyaddondo and Whyte, 2003), or indeed within more holistic notions of work placed actions such as 'workhood' (Gross et al., 2012), are all plausible. It is nevertheless argued here that the theoretical basis of the SIA complements these alternative approaches and that conceptualising VHT work motivation through the theoretical lens of the SIA has enabled the generation of useful and promising findings.

While drawing on the SIA has provided important insight regarding the nuanced local drivers of VHT work motivation, its function as the theoretical basis of intervention effectiveness was less clear. While it appears VHTs were largely already motivated (see Chapter 4) and indeed identified collectively (see Chapter 5), it was apparent that identifying collectively as VHTs was also achieved through other aspects of daily VHT life which could have diluted the effect of interventions to promote VHT identification. For instance, as noted in Chapter 6, VHTs used phones and sought community interaction to further their own and the collective's interests across intervention and control areas. While these results may indicate the intervention approach had little impact, further studies, where low levels of CHW motivation and identification with the CHW collective are recorded prior to intervention, are warranted before utilising the SIA in this manner can be discounted.

In calling for further studies, a note of caution is worth highlighting with regard to intervention development drawing on the SIA. While a certain amount of collective identification might be useful for workers, their programme and indeed beneficiaries, extreme levels of identification may be counterproductive for all groups. For instance, if levels are too high, a worker may neglect activities that fall outside those considered of benefit to the collective. This may for instance include neglecting activities important to the other identities they have (e.g. their family identity) (Van Knippenberg and Ellemers, 2003). Intervention and programme designers should exercise caution in this regard.

The SIA was found to be a useful analytical lens for understanding VHT work motivation. It was also possible to develop a valid and reliable, four item VHT social identification scale though, as recommended in Chapter 5, contextual adaptation is recommended before use with other CHW respondent groups. The purpose of the social identification measurement

scale was to detect any variations in social identification across study areas with the interventions designed to lead to improved identification with the VHT collective. Instead high social identification was recorded across intervention and control areas. Strong, positive correlations between social identification and work motivation were also found across intervention and control areas and respondent demographic groups. In such CHW populations, where pre-existing social identification and work motivation levels are seemingly high, use of a social identification measurement scale may help demonstrate why interventions based on the SIA has minimal impact. In conditions where low social identification with the CHW collective is recorded alongside weak or negative correlation between social identification and work motivation there would appear to be greater potential for impact. Had this been found with the sampled VHTs, a case for the utility of the measurement scale may be more easily made. It nevertheless appears that the four item VHT social identification measurement scale, and indeed a single item if survey space is limited, could be reliably and validly utilised for measuring VHT programme social identification.

In section 7.5 below, insights provided into VHT work motivation by the SIA through this PhD research are combined with directions from the literature to suggest a potential way forward for VHT work motivation programming and research. Where applicable, directions are also suggested for comparable CHW work contexts.

7.5. Implications of PhD findings for research and programmes aiming to improve community health worker performance through focus on their work motivation

Recommendation 1: first provide CHWs with the resources to perform or consider alternative lines of enquiry to work motivation when seeking improved CHW performance

The findings of this PhD have consistently recognised that VHT work motivation and performance occurs against a backdrop of unreliable drug supply. This challenge was recognised at the start of the inSCALE project in the protocol for the trial design (Källander et al., 2015a). Indeed the study was made possible through the delivery of iCCM packages to VHTs by the national and sub-national health services with funding from another Malaria Consortium project (The Canadian International Development Agency - iCCM project)

(Källander et al., 2015a). The data generated through the PhD suggest this was not uniformly or reliably achieved with this scenario also recognised by the inSCALE project when presenting their final project results (Källander et al., 2015b). It is recommended here that efforts be maintained towards securing the support VHTs want and need. This recommendation is made while acknowledging the challenge of securing the necessary support for CHWs in Uganda and elsewhere to perform, especially equipment, drugs and appropriate and regular supervision, as noted across the literature (Bhattacharyya et al., 2001, Haines et al., 2007, Perry and Zulliger, 2012, Perry et al., 2014, Rowe et al., 2018). Also recognised in the literature is the challenge of unrealistic expectations among CHWs with regard to securing such support (Bhutta et al., 2010, Kane et al., 2010, Kok et al., 2015b).

Despite these challenges, it is recommended that CHW *task based* performance improvement efforts be focused on providing CHWs with the necessary tools and support before attempts are made to motivate them. The reason for this is to avoid CHW 'dissatisfaction' of the type proposed by Herzberg's in his two factor motivation theory (Herzberg et al., 1959). Herzberg suggests that before motivational influences are introduced, the conditions that satisfy workers must be in place (Herzberg et al., 1959). Indeed, if such supplies and support cannot be provided, attributing sub-optimal CHW performance to poor CHW motivation would appear to be a diversion from the more pressing challenge of a weak health system (Haines et al., 2007). If the challenge of securing a reliable supply of necessary CHW resources endures, there is an argument for limited funding to instead be allocated to supply chain or health system strengthening activities instead of motivation programmes. So doing may help address the challenge of health system weaknesses contributing to the de-motivation of CHWs identified in a recent systematic review (Shipton et al., 2017).

A related recommendation of this PhD is to recognise the value of what VHTs, and potentially CHWs elsewhere, are motivated to do and actually achieve despite a lack of support. The resilience and local health focus of the VHTs studied in this PhD were often inspiring, particularly given the competing demands for their time and resources. Supporting and recognising the value of existing efforts would appear to be preferable to highlighting performance shortfalls if programmes are to be successful in motivating VHTs to maintain 'the desired organisational activity with any gusto or imagination' (Haslam 2004, p. 77). Certainly it would seem fairer than suggesting a lack of worker motivation is to blame for poor performance outcomes when VHTs are maintaining a level of performance despite

health system failings. Utilising the local knowledge of VHTs may be a more appropriate focus. It is the recommendation here that this emphasis be embedded in any future volunteer CHW motivational strategies. This recommendation echoes those appearing elsewhere in the literature calling for health system strengthening efforts to be stepped up in support of local attempts at performance improvement (Campbell and Scott, 2011, Rowe et al., 2018).

Recommendation 2: If CHW work motivation remains the focus despite unreliable supply of support and resources, research and programme emphasis should be on a more nuanced concept of CHW work performance motivation

In this section the case is made, based on the findings of the PhD, for a more nuanced understanding of CHW work performance motivation; specifically that a clear distinction be made between *extra role* and *task based* CHW performance. A rationale for the importance of this distinction is presented based on the results of the PhD before recommendations are made for how this understanding might be operationalised in a research and programme setting. This discussion relates to voluntary CHW cadres such as Ugandan VHTs in acknowledgement that the drivers of work motivation for paid CHWs may differ in important ways.

Based on the quantitative and qualitative results presented in this PhD, VHTs appeared to be motivated despite sporadic drug supply. The qualitative results of this PhD suggest that the actions VHTs are motivated to take are consistent with maintaining the community-level esteem in which they are held. VHTs were found to largely do this through the pursuit of what have been termed *extra role* performance activities. Given these actions are broadly in line with VHT programme goals, if not clearly stipulated in the policy (MoH_Uganda, 2010b), linear assumptions regarding poor drug supply leading to a lack of VHT performance motivation appear to be inaccurate for this population. Given the contextually specific nature of the *extra role* performance activities VHTs were motivated to take, it also appears to be an overly simplistic conclusion. The results of this PhD suggest that a more nuanced conceptualisation of VHT work performance motivation is instead required.

Studies of CHW performance motivation tend to either focus on task based performance functions or assume that what performance entails is self-evident (Gopalan et al., 2012, Chen et al., 2004). For instance, a recent systematic review that analysed 140 papers with the aim of understanding the intervention design factors that influence performance of CHWs in low- and middle-income countries did not define what was specifically meant by 'performance'

(Kok et al., 2015a). This review grouped 'individual CHW factors' (including motivation), 'mediating processes' (e.g. improved productivity) and 'end-user influences' (e.g. improved health seeking behaviour) together as an indicator of performance. Other reviews simply frame performance motivation as only applying to task based performance (e.g. Naimoli et al., 2014). Based on the findings from this PhD, what is recommended instead is for programmes to specify which *task based* performance behaviours are desired and to build a strategy around motivating those while acknowledging the importance of and motivating complementary, *extra role* performance behaviours.

Motivating *task based* performance while ensuring *extra role* performance motivation is maintained is likely to be a challenge. This has been recognised in the literature when the introduction of incentives for certain behaviours has been discussed; specifically, the risk that other, unpaid or non-incentivised tasks may be neglected (Glenton et al., 2010, Kok et al., 2015b, Sarin et al., 2016). Such eventualities indicate the need for an approach that recognises the range of actions CHWs take. This is particularly so for VHTs who have been found to prioritise *extra role* performance activities. Based on the evidence presented in this PhD it is recommended that *extra role* performance activities, as an example of those that are less tangible and therefore less likely to be materially incentivised, should be recognised and rewarded in a manner that complements attempts to incentivise task specific performance behaviours. Recognition of this need is the first step. Operationalisation of an effective strategy is the critical second step.

The results of this PhD provide an indication of how to potentially develop complementary CHW *task* and *extra role* performance motivation strategies. When seeking to incentivise both, or indeed either, within CHW populations that identify collectively such as the sampled VHTs in this study, incentives should appeal to group rather than individual goals. The reason is that collective goals would appear to have become self-goals for this population and have therefore become intrinsically motivating (Van Knippenberg and Ellemers, 2003, Ellemers et al., 2004). In addition there is some evidence to suggest materially based (Fehr and Falk, 2002), individually oriented (Wright et al., 1993) and extrinsic (Lepper et al., 1973) incentives may undermine intrinsic motivation and even create perverse incentives (Glenton et al., 2010). For instance, work with Indian Accredited Social Health Activists (ASHAs) suggest that establishing task focused performance incentives on some but not all tasks often leads to a CHW preference for the performance of incentivised tasks (Scott and Shanker, 2010, Srivastava et al., 2009). In these studies, specific tasks such as bringing people to the health

facility were incentivised, while community mobilisation activities were not, leading to a decline in incidence of the latter. Based on the data presented in this PhD, adverse performance effects may be experienced should *extra role* performance remain unrecognised and under-valued.

A further issue is that conceptualising incentives as either intrinsically or extrinsically motivating may be unhelpful. For instance, Glenton et al (2010) have recognised how strongly entwined, ostensibly intrinsically and extrinsically motivating incentives are within the Nepalese Female Community Health Volunteer population. Thus, making a distinction between intrinsic and extrinsic motivation may be less useful than exploring the nature of the relationship between the two and how it is affected by the working context. In the UK, studies of the quality of care delivered by low paid care workers have led to the recommendation that research should focus less on whether worker motivation was derived from 'love' (i.e. altruism or 'virtuous reward', often seen as intrinsic) or 'money' (i.e. financial reward, often seen as extrinsic) and more on the relationship between the two (Bjerregaard et al., 2015). Indeed the very classification of incentives as either intrinsically or extrinsically motivating seems to be problematic. This has been demonstrated in a study of organisational psychologists where 28% indicated that 'recognition' was an intrinsically motivating factor, 41% that it was extrinsic, 30% that it could be either and 1% advising they were unsure (Dyer and Parker, 1975).

A positive solution based on the presented evidence may be to heed calls in the literature to consider CHWs as community members whose motivation is tied to the needs of their community (Bhattacharyya et al., 2001, Campbell and Scott, 2011, Franco et al., 2002, Kyaddondo and Whyte, 2003). This is by way of contrast with commonly implemented CHW performance incentive strategies that focus on forms of reward for specific tasks (Colvin, 2014). Such approaches tend to encourage a '*what's in it for me'* attitude when socially identifying VHTs appear to be looking at their organisational and community life in terms of '*what's in it for* us' (Haslam, 2004). By appealing to community wide goals, and ensuring CHW required tasks are complementary to their achievement, the results of the PHD suggest performance motivation may be maintained and potentially enhanced. Such a strategy would require preliminary, qualitative enquiry to establish the nature of shared community and CHW goals. This is compatible with a recent call for greater contextual insight into health worker performance drivers (Rowe et al., 2018). Recognising the variety of local challenges CHWs face and often effectively deal with in such a way has the potential to maximise CHW's

role as advocates for communities as well as for health systems within communities (Mlotshwa et al., 2015); a role also conceptualised as being an effective 'broker' between community and health systems (Kok et al., 2016).

As a result of these insights it would appear that strategies to engage and maintain VHT performance motivation, and potentially that of CHWs elsewhere, should consider not exclusively focusing on performance incentives for individual workers. If they do, they may benefit from appealing to individually internalised group goals uncovered through qualitative enquiry. In so doing it may be possible to effectively move towards 'fostering a stronger culture that emphasises quality' (Rowe et al., 2018. P.3). In addition, if more task based performance motivation is the goal for programmes then there is a need to be more specific with regard to which behaviours we want VHTs to perform.

Recommendation 3: CHW work motivation measurement scale designers should develop domains and items from qualitative understanding of local motivational drivers divided into task based and extra role performance motivation

This section contains a brief reflection on what has been learnt from the development of the VHT work motivation measurement scale. As the development process has been documented in some detail in Chapter 4, including reflection on the results in light of the broader literature, this section will be confined to exploring the next, recommended steps for researchers and programme designers.

In Chapter 4 it was noted that the high scores recorded on the VHT work motivation scale by VHT respondents was consistent with notably high scores from other recent studies exploring health worker motivation (Mutale et al., 2013, Morrison et al., 2015), community health worker motivation (Vallières et al., 2016) and community health worker motivation in Uganda (Brunie et al., 2014, Mercader et al., 2014, Sanou et al., 2016). In the previous section, additional challenges related to the lack of consistent definitions in the literature of performance motivation was identified. The overlap between motivational drivers conceptualised as indicative of intrinsic and extrinsic motivation was also noted and a discussion of the implications of the distinction noted in this PhD between *task* based and *extra role* performance motivation was presented. It would appear reflection on the way forward for the measurement of volunteer CHW performance motivation is overdue.

Reflecting on the results of the VHT work motivation measurement scale development process at the end of Chapter 4, the recommendation was made for further studies with a

larger sample size in order to explore and potentially replicate the findings presented. For researchers with the resources and inclination to develop a new measurement scale, it is, in addition recommended to first specify the work related tasks they wish to check or ensure the cadre of VHTs or other CHWs being investigated are motivated to perform. *Task* based motivation measurement scale items can then be developed based on conventionally accepted definitions such as 'an individual's degree of willingness to exert and maintain effort on assigned tasks' (Naimoli et al, 2014. P. 5). Qualitative research should then be conducted to ascertain the performance goals valued by VHTs or other CHWs and what motivates their achievement. Based on the qualitative results presented in Chapters 3, 4 and 6 of this PhD, for VHTs and potentially other CHW cadres, these are likely to include maintaining levels of community trust and respect, continuing to learn, being recognised and feeling valued by established members of the health system, and achieving improved local health results.

Based on the qualitative findings, CHW identified goals can be divided into domains related to specific *tasks* and to other aspects of the role that may be considered related to *extra role* performance. Goals should also be checked against what the programme under investigation is trying to achieve; that is, for example, if an aim of the programme is to create conditions where VHTs are provided with the opportunity to learn, then the degree to which VHTs are motivated by this would be important to include in the measurement. While it may seem to make little sense to incorporate this measure if it was not part of the programme, if it was identified as important to VHTs for their motivation, the programme may be wise to incorporate it in their programming and indeed their motivation measure. If left out of both programming and measure it could still potentially provide an indication for qualitative enquiry regarding motivational drivers. Measurement scale items can then be developed to gauge the degree of willingness to exert and maintain effort towards the achievement of the different goals divided into *task* based and *extra role* performance motivation domains. If programme designers have managed to motivate *task* based performance without undermining *extra role* performance, and levels of both types of motivation were not already high, improvement may be seen in both motivation domains.

Though this specific recommendation could not be found in the literature, the premise on which it is based has support. Several studies have identified the importance of *extra role* performance to community health worker motivation though they have used different terminology. For instance, the importance of recognising the role played by the local context

and community on CHW motivation has been recognised (Bagonza et al., 2014, Ludwick et al., 2014, Mercader et al., 2014, Banek et al., 2015, Sanou et al., 2016, Singh et al., 2016, Winn et al., 2018) as well as the diverse range of local tasks CHWs take on and value (Brunie et al., 2014, Mlotshwa et al., 2015, Kambarami et al., 2016). In other studies the important role played by CHWs as conduits, brokers and champions between communities and health systems is emphasised (Kok et al., 2016, Vallières et al., 2016).

The challenge of countering social desirability bias has been discussed through the PhD. While this can't be completely countered when developing a VHT motivation measurement scale, basing scale item development on programme goals and the performance goals of CHWs themselves may be more locally meaningful and therefore less subject to this influence. Three VHT motivation measurement scale items were developed based on formative research conducted with VHTs (see Chapter 4). Two were included in the final version of the measurement scale with the item designed to indicate a desire to help others, or 'altruism' excluded because >80% of respondents strongly agreed with the Likert scale item. The altruism item may have lacked sensitivity and there is little indication that these items avoided the same social desirability bias suspected to be at play for the remaining items. Nevertheless, two items developed based on qualitative results were found to be stronger indicators of the underlying, latent construct of work motivation than several other, theoretically derived items that were eventually excluded from the scale. While this is hardly conclusive evidence, it does lend support to the argument that greater reliance on locally generated indicators of CHW work motivation is warranted.

The recommendations presented here aim to build on the emphasis of the research evidence in the literature. In so doing the goal has been to provide a more nuanced and useful notion of volunteer CHW work motivation that can inform programmatic emphasis and research design.

7.6. Limitations of the study

As discussed above, the research in this PhD has contributed to a more nuanced understanding of the drivers of Ugandan VHT work motivation. Through the methods described, attempts have been made to ensure the data collected and analysed is valid and reliable and that, relatedly, the conclusions drawn are sound. Despite this, the study has several limitations which are noted here.

Important limitations were noted in Chapters 4 and 5 where the development and validation of the VHT work motivation measurement scale and the adaptation and validation of the VHT social identification measurement scale were presented. These are summarised along with the main findings from this process in Table 7.1. Larger sample sizes and the availability of comparison measures may have aided conclusions regarding scale validity. Sample sizes were limited by the resource capacity of the inSCALE project (see Chapter 1 for background). The absence of comparison CHW work motivation and social identification measures which would have assisted assessments of convergent and therefore criterion validity of the scales were not available at the time of data collection as none could be located through literature searches. As a result, further studies utilising the measurement scales are recommended to confirm validity and reliability.

High scores were recorded for both work motivation and social identification using the two measurement scales developed. This issue is discussed in Chapters 4 and 5. It is worth emphasising here once more that this issue should be borne in mind when interpreting the results presented in this PhD and for future research. The possibility of social desirability bias informing VHT responses was noted in Chapter 1 where several specific strategies were introduced with the aim of countering this influence in the qualitative approaches taken (see section 1.7 'positionality'). While these strategies may have mitigated against the impact of social desirability bias, they are unlikely to have been completely effective. The approach taken has nevertheless led to the generation of useful insights derived from qualitative data in particular. These results have been discussed through the PhD and in most detail in Chapters 6 and 7.

The risks of social desirability bias informed the non-prescriptive, associative interview methodology employed to collect qualitative data reported in Chapter 6. By inviting respondent associations with their work, the aim of the approach was to encourage VHTs to elaborate on their experience with minimal interruption and direction. While the method was successful in eliciting rich information, the nature of the method was such that what was most important for respondents was highlighted and explored. This content prioritisation of respondents may not have been immune to the social desirability bias the method was designed to avoid. As noted in Chapter 6, the lack of prescription in the associative interview method also meant there were content gaps in VHT testimony. Principle among these was commentary regarding the technical aspects of the VHT role related to treating children

under five years of age. While this usefully served to highlight the areas of importance from a VHT perspective, it shed little light on this important aspect.

Associative interviews are a relatively new method and, despite yielding promising results, there are other approaches worth exploring in situations where there is a risk of social desirability bias. For instance, an approach utilising probes within the qualitative research encounter that signal to respondents that comments that are critical of their work and circumstances are ok and a welcome addition to the research. While a more prescriptive approach may have elicited information regarding important content areas of interest, it would also have risked telegraphing to respondents that this was a content area interviewers thought was important and should therefore be discussed in their response. This risk would also be present when adopting an approach indicating to respondents critical responses are ok. It may simply result in the provision of responses in that specific area rather than other areas of priority for respondents. A further methodological option may be to utilise a more embedded research approach such as long-term participant observation characteristic of anthropological approaches. Such an approach was outside the resource capacity of the inSCALE project to support in this study.

The SIA has provided the theoretical lens for understanding what VHTs value in their work and why they are motivated to do it. This is the main, theoretically and empirically derived insight from the PhD. The utilisation of the SIA within the PhD was however twofold. It was also used, along with formative research findings, as the basis for the development of the interventions in terms of the specifically targeted components considered likely to positively influence VHT work motivation (see Tables 3.7 and 3.8). This use was predicated, in part, on VHTs having the means available to perform their VHT role. This wasn't always the case as drug supply was found to be unreliable. The inSCALE project evaluation included a household survey of carers where data related to appropriate treatment for fever, diarrhoea and pneumonia of their child below the age of five was captured (Källander et al., 2015a). This survey found that 15% of interviewed carers said they had been referred by a VHT because there were no drugs while 61% reported having not consulted a VHT because they were aware there were no available drugs (Källander et al., 2015b). It has been suggested that 'attempts to build identification should therefore only be undertaken when the focus of the identity is in line with the performance in question, and when it is clear that additional conditions that are required for optimal performance have been met' (Van Knippenberg and Ellemers, 2003)(P.42). While the focus of VHT identity and its alignment with VHT

programme goals has been discussed above and in Chapter 6, the conditions necessary for performance, principally the reliable supply of drugs, were not consistently provided despite assurances they would be through the government of Uganda's iCCM programme with CIDA funding (see Chapter 1).

There were a number of criticisms of the SIA noted in Chapter 2. Following these, a rationale for why the SIA was still considered the most appropriate theory to draw on, and an explanation of how these criticisms would be countered, was presented. The main criticism was that the theory was socially reductive due to its history of application in individually focused research designs typically conducted in laboratory settings removed from the social and cultural nuance that are theoretically proposed to drive identification with collectives. The research in this PhD has sought to complement quantitative research methods utilising a validated social identification measurement scale with qualitative approaches. In so doing, it has sought to triangulate findings utilising multiple approaches while recruiting respondents in their own communities. In addition, it was proposed that research findings would be analysed drawing on a critical social psychological perspective that also considers the wider social ecology informing VHT work motivation. While this was possible to a degree (see discussion of power above and consideration of symbolic capital, beliefs, behavioural norms and working conditions), a broader range of factors at play in the social ecology of VHTs could not be considered given the resource constraints of the PhD. For instance, the role played by macro-economic factors and specifically their impact on VHT aspirations, critical consciousness and empowerment (Campbell, 2003) and the important role played by gender based social norms (Morgan et al., 2016).

The PhD, as explained in Chapter 1, was enabled by the inSCALE project in terms of fieldwork financing and logistical support. In exchange, the PhD made a contribution to the aims of the inSCALE project; particularly to the development of the inSCALE interventions (Chapter 3) and the process (Chapter 6) and outcome evaluations (Chapters 4 and 5). Being so tied to the inSCALE project necessarily resulted in resource and logistical constraints over methodological decision making. For instance, additional items developed based on qualitative formative research findings may have been added to the motivation measurement scale had the directive from the inSCALE evaluation lead not been to limit the number of items included. A greater number of qualitative associative interviews with increased diversity among the sampled VHT respondents could also have been conducted had the resources of the inSCALE project allowed. In addition, a more comprehensive

analysis of the wider social ecology and power relations influencing the lives and work of VHTs may have enabled greater insight regarding VHT work motivation drivers and decision-making. Such analysis was beyond the logistical and ideological capacity of the inSCALE project to support. While these hypothetical differences in methodology may have added useful insight, the support of the inSCALE project, and relative autonomy enjoyed regarding the design and conduct of the research within this PhD, was nevertheless considerable.

An additional constraint related to the inSCALE project was the limited access granted to the main outcome data produced by the project. A condition of inSCALE project support to this PhD was that it not draw on these findings. The final outcome data from the inSCALE project are yet to be published but are forthcoming. The PhD student will be a named author on the final, published papers.

7.7.   Main contribution of the PhD

In this final section reflections on the main methodological and empirical contributions of the PhD are made. The section and PhD concludes with a comment on the future direction of VHT and CHW work motivation research and programming.

7.7.1 Main methodological contributions

The methodological contributions made in the PhD relate to the development of two measurement scales and the use of an innovative qualitative method.

A detailed account of the mixed methods approach to the development and validation of a VHT work motivation measurement scale have been presented in Chapter 4 and the adaptation and validation of a VHT social identification measurement scale in Chapter 5. In so doing calls in the literature for a greater consideration of the contextual influences on community health worker motivation have been heeded. During the scale development process this was achieved by incorporating scale items in the VHT work motivation measurement scale that were derived from qualitative VHT interview data and by adapting a social identification scale; the theoretical basis of which is social and therefore, by definition, contextual. The case for a higher proportion of scale items to be incorporated into future CHW work motivation measurement scales based on formative research findings has been made in this chapter. The case for incorporating the four item, social identification measurement scale into assessments of CHW motivation has also been made. The VHT social

identification measurement scale, in its four or single item form depending on space constraints, has been demonstrated to be valid for use with Ugandan VHTs. Given the analytical insights offered by the SIA, utilisation of this scale, where pre-existing CHW work motivation is low, has merit.

The challenge of social desirability bias influencing data quality has been a consistent theme throughout the PhD. A range of steps to counter this influence have been implemented and discussed. This includes the associative interview method discussed at length in Chapter 6 with the limitations of this approach when mitigating against the risks of social desirability bias discussed in Chapter 7. By inviting VHT respondents to reflect on what they most associate with their work it was possible to elucidate VHT contextual priorities. This approach is recommended for future qualitative enquiry with CHWs where nuanced insight into the local experiences and aspirations of CHWs is sought.

7.7.2 Main empirical contributions

The main empirical contributions made by the PhD relate to the high scores recorded for both VHT work motivation and social identification, and the nature of their relationship.

VHTs are highly motivated according to estimates of VHT work motivation based on the VHT work motivation measurement scale. This result echoes those of other CHW work motivation studies. VHT social identification with the VHT collective was also found to be high and VHT work motivation and social identification scores were found to be strongly, positively correlated. Qualitative associative interviews revealed that VHTs are motivated to perform the actions that maintain the collective esteem in which they and the VHT collective are held, that they believe this will ensure their continuation in role and the potential for future material benefit, and that this belief and approach is largely a response to unreliable drug supply. Their focus, as VHTs, is on maintaining *extra role* performance activities. In Chapter 6 a model of VHT *extra role* and *task based performance* motivation in response to this finding was presented. This model explains how community status and standing are preserved in the absence of drugs through holistic effectiveness in contrast with task specific effectiveness as mandated by the VHT programme. While *holistic* and *task specific*

effectiveness are not mutually exclusive[48], holistic effectiveness was the main VHT performance priority.

Other studies have identified the important role played by being a member of the community in which they work to the work motivation, effectiveness and sustainability of CHWs as a functioning component of health systems that utilise this cadre of workers. The findings of this PhD echo these results while supporting calls for continued focus and increased emphasis on this aspect of CHW identity. This PhD offers the SIA as a useful theoretical tool for supporting such focus. It does so while reiterating the importance of local, qualitative insight into the influences on CHW work motivation and a more nuanced appreciation of its dimensions.

7.8. Conclusion

Community health workers continue to make an important contribution to improved health outcomes within communities. Uganda's VHTs typify this contribution. This PhD has demonstrated that a focus on VHTs, and potentially CHWs elsewhere, as community members as well as community workers offers important insights. It has enabled recognition of the performance priorities CHWs hold while acknowledging that these often but not always coincide with the priorities of CHW programmes. VHTs are focused primarily on maintaining their role and the potential this brings for future livelihood benefits to them as well as to their family and community. The intersection between such priorities and those of scaled up CHW strategies should be the focus of efforts to understand and positively influence CHW performance motivation. It is essential this is understood through qualitative enquiry. This PhD has demonstrated the important contribution the Social Identity Approach can make in support of this endeavour.

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[48] For instance, the important role played by clinical effectiveness in the local credibility of VHTs was emphasised by VHT respondents.

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9. APPENDICES

9.1 Key components of the two inSCALE interventions

From: (Källander et al., 2015a, Frank et al., 2015, Frank et al., 2016)

Table 9.1: Key components of the inSCALE interventions

Content of the participatory community engagement approach / 'community arm'	
Intervention component	**Key features**
Key principles	Village Health Clubs (VHCs) aiming to improve child health through a community-led forum with the VHT as the main focus point for improving local child health outcomes Attendance and operation based on five key pillars: • Open to all who wish to attend • Village owned • Intended to support VHT activities and goals • Strength based (i.e. focusing on village assets) • Fun and focused
Training and club facilitation	Two VHT club facilitators from each village trained for four days in how to recruit and operate VHCs. Focus on encouraging club members to plan and carry out the club's activities using an participatory learning and action cycle
Accessories and materials	• Picture cards for ranking common child health problems • Instructional VHC flip books • T-shirts for VHT facilitators • Membership cards for participants • Stamps and other stationary to help with the establishment and operation of the clubs in the communities
Supervisor support and patrons	• Village leaders were appointed as patrons and sensitised to support the mobilisation of the communities to join the clubs • VHT supervisors, health assistants and sub-county development officers were trained by District Health Educators and Malaria Consortium master trainers in effective supervision skills using a core competency assessment tool, and as trainers of VHTs
Operation	A four-step participatory learning and action cycle where, facilitated by VHTs, group members over a series of meetings: 1. Identify, discuss and rank local child-health challenges 2. Discuss and plan solutions with a focus on supporting the functionality of VHT services 3. Take planned actions to meet identified challenges 4. Monitor, report to the group and communicate on their progress before starting the cycle again
Number of users	A total of 884 VHTs across 13 sub-counties in eight districts of Western Uganda to facilitate the set-up of 440 VHCs
Content of the mHealth-supported approach / 'technology arm'	
Intervention component	**Key features**
Mobile phone	Nokia C2-00 (Java enabled dual SIM card feature phone)

	NB: VHTs can use phones for VHT and own purpose by switching between personal and VHT SIM card on supplied inSCALE VHT phones
Accessories	Solar lamps (Sun King Pro) with multiple phone charging pins
Software	• 'inSCALE Mobile VHT System' sends to VHTs on supplied phones status of current drug stock levels and, based on VHT reports sent via supplied phone, aggregated weekly reports on patients seen (sex, malaria rapid diagnostic test results, symptoms and classification of signs, treatment given and outcome of treatment) • Respiratory rate application where user (i.e. VHT) presses the centre button for each breath observed in patent during one minute
Feedback messages	Relevant and personalised feedback messages based on submitted routine VHT reports sent instantly after reports are received
Monthly messages	Monthly messages sent to VHTs designed based on VHT testimony and to resonate with the training received emphasising the importance of their role, how best to perform it and to encourage good performance
Closed user groups	Closed user groups (CUGs) allow free, unlimited calls within the network between VHTs and their supervisors. It promotes increased frequency and quality of contact between CHWs and their supervisors, as they do not need to worry about costs and calls being disconnected when credit runs out. Phone numbers provided to all VHTs participating in the intervention of other participating VHTs and supervisors at sub-county level in the sub-county. Content of communication not prescribed.
Supervisor support	• Automated SMS sent to supervisors flagging problems and strengths identified in the data submitted by VHTs on supplied phones and alerting supervisors bout VHTs that may require targeted supervision • Trained as trainers and in effective supervision skills using paper based core competency assessment tools
Number of users	A total of 1,277 VHTs across 13 sub-counties in eight districts of Western Uganda

9.2 Establishing Village Health Clubs to improve community health worker motivation and performance: DfID learning paper 2015

About the learning paper series

Since starting operations in 2003, Malaria Consortium has gained a great deal of experience and knowledge through technical and operational programmes and activities relating to the control of malaria and other infectious diseases.

Organisationally, we are dedicated to ensuring our work remains grounded in the lessons we learn through implementation. We explore beyond current practice, to try out innovative ways – through research, implementation and policy development – to achieve effective and sustainable disease management and control. Collaboration and cooperation with others through our work has been paramount and much of what we have learned has been achieved through our partnerships.

This series of learning papers aims to capture and collate some of the knowledge, learning and, where possible, the evidence around the focus and effectiveness of our work. By sharing this learning, we hope to provide new knowledge on public health development that will help influence and advance both policy and practice.

www.malariaconsortium.org/learningpapers

A village health team member says that through the village health clubs, people are gaining a better understanding of prevention of childhood diseases.
Photo: Tine Frank

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Executive summary

Malaria Consortium's inSCALE project has been working in Uganda to help scale up quality integrated community case management programmes to improve child health. This Learning Paper details the process of establishing Village Health Clubs with the aim of improving the motivation and performance of community health workers – known as village health team members (VHTs) in Uganda.

Formative research from inSCALE has shown that status and community standing are important to VHTs in Uganda, yet many feel the purpose of their work is not well understood in their communities. The Village Health Clubs were designed as a participatory community engagement approach to promote the VHTs as key village health assets.

The Village Health Clubs were implemented through a series of processes, which included stakeholder discussions, developing and pre-testing job aids and sensitisation plans and training 880 iCCM VHTs using a training-of-trainers approach.

VHTs received initial support and supervision in setting up and running the clubs. Ongoing progress reviews and process evaluations, have found that 59 percent of the clubs were still active nine months after training. A majority of VHTs reported a positive impact on their status and standing in the community; community support; a feeling of connectedness to the community; improved performance and motivation; and increased access to and use of appropriate treatment for children under five.

Some of the main challenges reported for Village Health Clubs were in relation to drug stock outs, which reduced club attendance as well as a lack of supervision of the Village Health Club facilitators. The key recommendations include linking the Village Health Clubs to income-generating activities for improved sustainability, as well as facilitating regular supervision by health facility supervisors. Due to the popularity of the Village Health Clubs, Malaria Consortium will continue to introduce this concept in and beyond Uganda, as well as incorporate the lessons learnt into the development and implementation of other social mobilisation activities.

The inSCALE Learning Papers

As part of the project's advocacy and communications components, inSCALE aims to promote 'coherent and coordinated policies' to advance best practices and innovations to improve CHW programmes delivering iCCM at country level. In support of this, inSCALE has been capturing knowledge and learning from the implementation of inSCALE interventions and sharing these through Learning Papers. Three complementing inSCALE papers have been published:

Developing intervention strategies (to improve community health worker motivation and performance) (2012), documents inSCALE's research and intervention design process.

Establishing Village Health Clubs (to improve community health worker motivation and performance) (2015) summarises knowledge and learning from the implementation of inSCALE's community intervention in Uganda.

Implementing mHealth solutions (to improve community health worker motivation and performance) (2015) documents implementation of the inSCALE technology intervention in Mozambique and Uganda.

To read the Learning Papers: www.malariaconsortium.org/inscale

" Overall the club has been successful. We have seen improved cleanliness in members' homes. They're now using drying racks and latrines and are clearing stagnant water and cutting bushes around their homes. There has been an improvement in their lives and in the health of community members."

Kabagenyi Scovia and Kiiza Langton, village health club facilitators in Kigungu village
Photo: Tine Frank

Introduction

Integrated community case management

Integrated community case management (iCCM) is an approach where community health workers (CHWs) are trained to identify and treat pneumonia, diarrhoea and malaria in children under five years, as well as to refer severely ill cases to the nearest health facility. Evidence in African countries shows that CHWs, if properly trained and equipped, have the potential to reduce child deaths from malaria, pneumonia and diarrhoea by up to 60 percent through the delivery of iCCM[1].

However, iCCM programmes have faced challenges in scaling up. The Bill & Melinda Gates Foundation, through a series of consultations with country programme managers and development partners, identified three main implementation barriers, related to supportive supervision; CHW motivation – through remuneration or otherwise; and monitoring and evaluation data for programme planning.

The inSCALE project

The Innovations at Scale for Community Access and Lasting Effects (inSCALE) project was a five-year multi-country study in Uganda and Mozambique funded by the Bill & Melinda Gates Foundation. The project was conducted between 2009 and 2014 (extended to 2016 in Mozambique) by Malaria Consortium in partnership with the London School of Hygiene & Tropical Medicine and University College London.

The aim of the project was to demonstrate that government-led iCCM programmes in two African countries could be scaled up while maintaining quality of care by addressing the barriers to iCCM implementation – namely, lack of supportive supervision and CHW motivation. This would be achieved by:

1.

Identifying best practices and innovations with the potential to increase CHW motivation and supportive supervision;

2.

Assessing the feasibility and acceptability of these innovations among different user groups;

3.

Evaluating the impact of the innovations through randomised controlled trials;

4.

Costing iCCM implementation and the innovations;

5.

Promoting the implementation and spread of iCCM by sharing findings and best practices with key national and international stakeholders.

Developing the intervention strategies

Step 1
Existing experience and theory
- Literature review
- History and context reviews
- Expert consultations

Step 2
Creating interventions informed by theory
- 'Best bets'
- Pile sorting
- Formative research

Step 3
Materials and monitoring tools
- Pre-testing of materials

Between January 2010 and August 2012, through a rigorous research, review and evaluation process*, a multi-disciplinary inSCALE technical team developed two intervention packages that were evaluated through randomised controlled trials. The two interventions were:

1.

The technology intervention implemented in Mozambique and Uganda. Promoting CHW learning and support, this approach aims to use low-cost technology, through the development of tools and applications for mobile phones, to increase CHWs' feeling of connectedness to the wider health system. The mobile technology developed by inSCALE supports CHW motivation and performance through self-learning, provision of job aids, data submission and performance-related feedback.

2.

The community intervention implemented in Uganda only. Promoting CHWs as key village health assets to improve motivation and performance, this community mobilisation approach is focused around the formation of Village Health Clubs as a platform for participatory and locally owned identification of health problems and solutions, followed by a learning and action cycle.

These two interventions were compared with control areas that received the standard Ministry of Health (MoH) iCCM package, implemented with support from Malaria Consortium[2].

Mozambique and Uganda were selected for implementation of the inSCALE project partly because they were among the four countries in which Malaria Consortium had been implementing an iCCM programme since 2009. Furthermore, the two countries have shown a willingness to make a firm commitment to community-based care as a way of reducing morbidity and mortality in children under five years; have very different models of community-based health delivery; and have demonstrated their ability to be regional leaders in this field. In Uganda, iCCM became a nationwide strategy for reducing child mortality in 2010, and the Mozambican CHW programme, locally known as *Agentes Polivalentes Elementares* (APEs), has been in existence for more than 30 years. However, in-country assessments and other literature identified an urgent need for strategies that improve performance and retention of CHWs if such iCCM programmes are to successfully provide high-quality care to sick children in both countries.

As the local APE strategy already incorporates substantial community components, the proposed inSCALE community intervention was not seen as sufficiently innovative for the Mozambique context. Therefore, and also because of time constraints, it was decided that Mozambique would implement only the technology intervention.

Under the iCCM programme in Uganda, where CHWs are known as village health team members (VHTs), each village should have an average of five VHTs, two of whom have been trained to distribute medicines under iCCM. There are no real literacy or education requirements – although ideal candidates are able to read and write the local language – and VHTs receive five days of basic health training, with six days of additional iCCM training for the iCCM VHTs. Notably, VHTs are volunteers, receiving only $5 a month to cover travel costs, and have an average catchment population of 250 people. Treating only children aged two months up to the age of five years, a VHT typically sees 20 cases per month.

Learning Paper **5**

Designing the inSCALE community intervention

The inSCALE formative research showed that, in Uganda, status and community standing are important to VHTs, yet many feel that their work and aims are not well understood in their communities.

The community intervention design process was circular, moving back and forth between findings and guiding principles from the theoretical review and formative research stages.

Existing literature showed several current village committees, such as the government's Village Health Committee, and groups had been unsuccessful owing to a lack of government involvement, infrequent meetings, groups being too exclusive and not representative of the whole community, a shortage of funding to take action and lack of a functional system in which the groups could operate, resulting in a lack of response to issues identified.

Formative research found purposeful and participatory community activities that are open to all, enjoyable and focused on positive local health outcomes were likely to be motivating and sustainable for VHTs and their communities.

After discussing and discarding different concepts and group structures that were found not to be sustainable, the inSCALE community intervention eventually evolved into a participatory community engagement approach called Village Health Clubs.

The Village Health Clubs seek to further engage those individuals who do not normally participate in community initiatives in order to maximise support around the VHTs and their work. The design of these clubs is based on recorded successes from existing structures in Uganda and Africa Applied Health Education and Development's (AHEAD's) community health club approach, which has proven effective in terms of hygiene behaviour change but has not been evaluated in relation to increasing CHW motivation or appropriate treatment[3].

inSCALE Village Health Clubs

Promoting VHTs as key village health assets to improve VHT performance, motivation and retention.

The Village Health Club approach aims to enhance the perceived value of the VHTs, both for themselves and for the communities they serve. This should lead to greater status for VHTs, as well as increasing demand for their services, contributing to the sustainability of their role and increased utilisation of health services for sick children.

"I know many mothers who have suffered because they did not have money for transport to the health facility. Now we have an emergency fund for club members, I know the money is there, and I feel happy and relieved."

Twaise Josephine, member of Tufeeyo Village Health Club, Hoima district
Photo: Tine Frank

What are Village Health Clubs?

Village Health Clubs are community-led forums that aim to improve child health with the VHT as the main focal point and facilitator. The clubs are based on five key pillars, and use a four-step participatory learning and action cycle designed to engage community members in taking action to solve child health problems.

Intervention components

Open to all	Village-owned	VHT-focused	Strength-based	Fun and purposeful

Village level forum facilitated by VHT where members:

Identify, discuss and rank child-health challenges

Discuss and plan solutions with focus on supporting the functioning of CHW services

Take planned actions to meet identified challenges

Monitor, report and communicate on their progress

Drivers of motivation

Standing, status, identity and value	Support and community supervision	Connectedness to the community

Expected outcomes

CHW performance and motivation

Access to appropriate treatment through:
Increased health behaviour of families
Availability, functionality, visibility of VHT

Use of appropriate treatment for sick children

" **I got the idea to build a latrine from the VHTs and the health club, to improve hygiene and avoid flies. Before, the younger children would get sick from diarrhoea a lot – maybe three times per month one of them would get sick. Now there is very little diarrhoea.** "

Aramanazani Grace, member of Kagamba-Kamu Village Health Club, Buliisa district
Photo: Tine Frank

By being locally relevant, focusing on VHT challenges and working to identify and action practical local solutions, Village Health Clubs help improve community members' understanding of what VHTs can and cannot do, and their potential to improve child health in the village. In doing so, Village Health Clubs:

- Improve the status and standing of VHTs as key village health assets;

- Increase VHT motivation and quality of service provision;

- Potentially increase demand for VHT services and the number of children accessing them; and

- Communicate to VHTs and other village members that VHT work is important, of value and appreciated.

Through the implementation of a participatory learning and action cycle, members define child health problems and decide on actions and solutions together. Over a period of three to four weeks, actions are implemented at household and community level to effect individual and collective behaviour change. Club meetings actively review activities and results.

The key innovations in the inSCALE community intervention are that Village Health Clubs are focused around VHTs, contrary to existing community groups and health committees, and are designed to be locally owned, with the VHTs accountable to the communities in which they operate. These innovations are meant to strengthen the intervention's sustainability beyond the life of the inSCALE project.

In the theoretical review and formative research stages, key guiding principles were identified that informed the design of both the community and the technology intervention packages. Theory determined that the interventions should promote CHWs as members of a collective by highlighting a sense of shared experience; focusing on alignment between CHWs and overall programme goals; and emphasising the actions that lead to good performance. The Social Identity Approach, a combination of social identity theory and self-categorisation theory, was selected as the theory most likely to lead to the development of effective, scalable and sustainable interventions[4]. The formative research and pre-testing provided the information to finalise intervention design and elements, as illustrated here.

The 5 pillars
Open to all
VHT-focused
A strength-based approach
Village-owned
Fun and purposeful

The inSCALE Village Health Club intervention design

Formative research	The 4-step action cycle	Testimonials
Participatory activities in the community that are open to all, enjoyable, purposeful and focused on positive local health outcomes delivered through the VHTs are likely to sustain community interest and engagement and be motivating for VHTs. Formative research revealed lack of this element as a key factor in why the government's Village Health Committee initiative was less successful.	**Step 1** Club formation The VHTs sensitise and mobilise local leaders and organise the first meeting to establish the club, inviting anyone in the community to join, encouraging members who do not usually participate in community activities. The community is informed of the purpose of the Village Health Club and new members are given membership cards.	"When we started the Village Health Club, we used religious leaders to pass on information. People in communities have belief in the religious leaders and this has helped increase the membership of our Village Health Club." VHT, Kyegegwa district
VHTs value technical feedback and supportive encouragement from both supervisors and community members. Often, the role of the VHT is misunderstood and community members do not know what the VHTs can and cannot do.	**Step 2** Prioritising child health problems; finding out causes and solutions; taking action at home The VHTs facilitate this step. In contrast with existing initiatives, this innovation is meant to promote the VHTs as key community health assets. Through collective problem-solving, communities will come to understand the full extent of the VHTs' role and responsibilities, facilitating solutions to VHT problems and enabling them to carry out their work more effectively.	"Club members now contribute transport money [for the VHT] to collect drugs from the health centre. These days they know our importance in the community. Some members, when they harvest their crops, they bring us some food in appreciation of our work." VHT, Hoima district
By tapping into existing strengths in the community, such as village networks and structures, the VHTs and community members can employ personal experience and knowledge, creativity and other communal assets to help solve identified child health problems. Changing the mind-set towards sustainability, clubs should harness support from non-governmental organisations to become self-sufficient, rather than relying on continued support.	**Step 3** Finding solutions and taking actions together Facilitated by the VHTs, health club members understand and focus on the community's strengths, such as local resources, people, skills and networks, focusing on the positives in the community rather than the needs and challenges. Applying these strengths, VHTs and members work together to solve identified child health problems.	"Community members now understand the importance of collective responsibility regarding health issues in the community, and this has prevented diseases and also improved on people's relationships in the community. They now work together for a common cause, especially when it comes to issues related to health." VHT, Masindi district
VHTs are motivated by their status and standing in the community and a sense of the value they add. If community members themselves chose the organising committee from people who choose to join up, rather than being selected by a local leader, club members are likely to feel a stronger sense of ownership, which in turn positively affects sustainability.	**Step 4** Reviewing our actions – how did we get on? What more do we need to do? This innovation, where communities are responsible for taking charge of their own health, improves the sustainability of the Village Health Clubs. As the community sees improvement in their general health, they are likely to attribute the change to the clubs and the facilitating VHTs – a great motivating factor for the VHTs.	"In the club, they identify a health problem in the community, discuss it and come up with solutions that will help get rid of the problem. So, everyone keeps reminding each other what to do. They have realised solutions have to come from them to improve their livelihood." VHT, Masindi district
Formative research showed the popularity of meeting attendance is dependent on the interest and relevance of the issues under discussion. 'Fun and purposeful' describes the spirit of actively making change happen through quick and tangible results, rather than waiting for outside help. Meetings were also seen as an effective forum for getting to know fellow community members and receiving information.	The fun and purposeful element of the Village Health Club design is a cross-cutting feature the VHTs apply across all pillars and action steps, often incorporating drama or performances to educate and demonstrate solutions to identified health problems in a relaxed and entertaining manner. Providing a safe, fun, supportive place to learn, and making the clubs locally relevant and interesting, this element can be key to improving the sustainability of club activities.	"People used to dislike sleeping under bed nets because it is so hot here. So we developed a drama showing how the mosquitoes bite mostly at night and how that leads to malaria, and people started sleeping under nets. People started attending the meetings. They would cheer and enjoy and join up as members." VHT, Buliisa district

Learning Paper **11**

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Implementing Village Health Clubs in Uganda

Processes

Key processes involved in implementing the Village Health Clubs included:

● Discussions with relevant MoH stakeholders to produce operation and implementation guidelines for the approach;

● Pre-testing of the Village Health Club concept with VHTs and community members to introduce the intervention and gather feedback on acceptability and feasibility, as well as testing images and messages on picture cards included in the flipbook;

● Development, design, pre-testing and revision of content for facilitators' guides and job aids, in particular the VHT flipbook, a multi-purpose job aid designed to ensure VHTs use participatory and interactive techniques; guide them through the four-step cycle; help pass on motivating behaviour change communication messages; and act as a reference for accurate child health information;

● Designing, pre-testing and producing reporting formats and membership cards for the Village Health Clubs, followed by pilot testing and revision based on pilot results;

● Developing, pre-testing and piloting a community-level sensitisation plan to explain and promote the Village Health Club concept to local leaders;

● Training through a supervised training cascade using a training-of-trainers approach.

Training-of-trainers approach

8 master trainers

Training-of-trainers:
39 sub-country trainers

884 iCCm VHTs trained as VHC facilitators
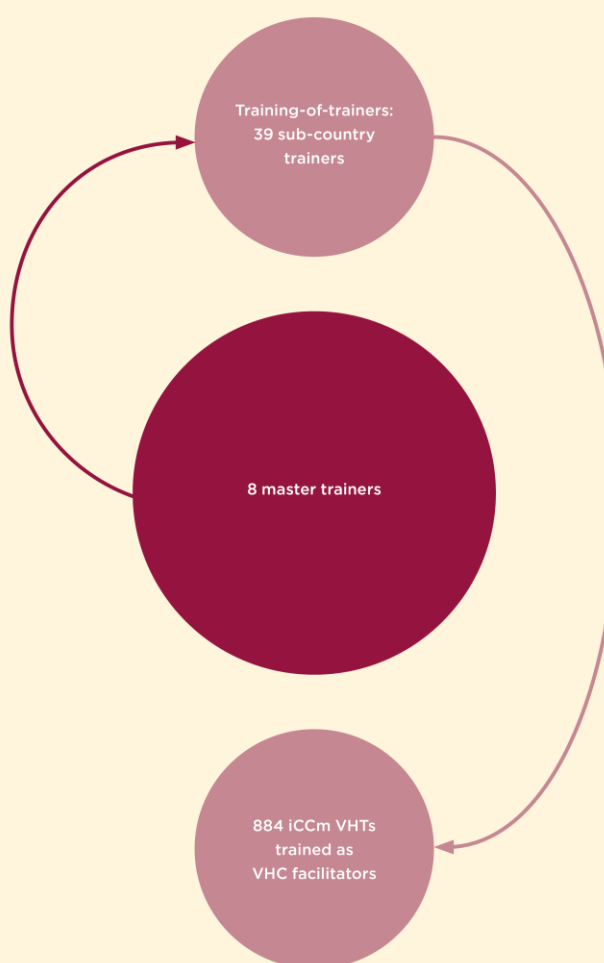
Training

The inSCALE community-based intervention involved 884 iCCM-trained VHTs from the five selected project districts, who were prepared through a training-of-trainers approach.

First, eight master trainers (five district, one MoH and two Malaria Consortium staff) went through a three-day training course, after which they conducted a pilot training with 17 VHTs. Lessons learnt from the pilot were incorporated into the training approach and materials.

Following this, two three-day training-of-trainers sessions took place, training 39 sub-county development officers, health facility in-charges and health assistants as trainers in adult learning, the participatory empowerment methodology and the Village Health Club approach and flipbook.

This step saw the development of a training-of-trainers guide, an individual progress chart, a peer observation form, a VHT workshop evaluation form and a VHT training report. Master trainers supported trainers in order to ensure the quality of the training and support their continuous learning in participatory approaches.

Additionally, 'supervising-the-supervisor' trainings took place, training VHT supervisors in the specifically developed competency-based checklist for VHTs on setting up and running Village Health Clubs.

The sub-county trainers trained two VHTs in each of the 440 project villages as Village Health Club facilitators. The VHT training sessions each had 20 VHT participants and were run by two or three sub-county trainers, with initial practical guidance and support from the master trainers. To strengthen their position as facilitators and key village health assets, the VHTs were equipped with:

- A flipbook and a set of child illness picture cards to facilitate Q&A sessions;

- A facilitator's starter kit of membership cards, stationery, certificates and t-shirts;

- Evaluation forms and attendance registers.

" I have learnt you take the child straight to the VHT if it has signs of diarrhoea. There's a picture in his book [inSCALE flipbook] of a woman carrying a sick child."

Rosemary Kaserenye, member and chair of Kitaleesa Village Health Club, Kyegegwa district

Photo: Tine Frank

Establishing Village Health Clubs

Following the training and the development of materials, the VHTs work with their peers and local leaders to establish Village Health Clubs in their communities, receiving supportive supervision from sub-county trainers to ensure the smooth set-up and running of the clubs. After an initial meeting with local leaders, a 'core group' meeting, including VHTs, supervisors and local chairpersons, takes place to come up with a sensitisation plan to publicise the first Village Health Club meeting.

This first meeting is meant to introduce the Village Health Club concept to community members, with the VHT leading discussions on the village's overall health situation, and to promote the benefits of working as a group to improve the community's health.

Once established, VHTs facilitate club meetings using a participatory learning and action (PLA) cycle. Identified child health challenges are ranked using picture cards, causes pinpointed, solutions discussed and actions decided on. Over a period of three to four weeks, actions are reviewed and discussed and further actions decided on if necessary.

As Village Health Clubs are designed to be fun and purposeful, the majority of the clubs employ some form of dance and drama entertainment in order to attract and retain members and to educate on childhood disease prevention and treatment in an enjoyable and interactive manner.

The intended supervision structure was designed to strengthen the intervention's sustainability by tapping into existing supervision layers in the health care system, and not to depend on continued donor support after the end of inSCALE. Defined supervision roles included:

- **Health facility supervisors and health assistants.** Already supervising VHTs for iCCM-related activities, and trained as trainers in the Village Health Club approach, these frontline health workers are perfectly placed for supervisory roles, including clarification of club activities and dealing with specific health-related questions raised in meetings.

- **Parish coordinators.** Chosen from the group of VHTs, the parish coordinators serve as a focal point and link between the clubs themselves and between the VHTs and health facilities.

- **Community development officers (CDOs).** Utilising existing layers in the health care supervision structure, the idea was that CDOs would have a vested interest in supervising the Village Health Clubs as they complement their existing activities and objectives.

- **Community leaders.** Often referred to as 'club patrons', these key community members can provide supportive supervision in the form of signing off and monitoring collective action plans, mobilising for and attending meetings and lending moral support/problem-solving.

- **Community members.** One Village Health Club innovation is the community itself as a form of supportive supervision mechanism, through VHT collaboration with and accountability to community members.

Progress review

Between January and March 2013, about two to five months after club rollout, a number of 'unpacking' exercises – one for each district – took place to understand why some VHTs and communities succeeded in launching Village Health Clubs while others did not. Across the project districts, individual experiences were compiled in detail – what had made VHTs succeed and how they had overcome challenges. Specific suggestions were then provided on how VHTs could improve the running and sustainability of Village Health Clubs.

District review meetings followed in September 2013 that introduced peer-to-peer learning for VHTs, pairing up those who are slow adopters to fast adopters, to channel advice and experience on how to overcome challenges in forming Village Health Clubs. Although not an intentional activity in the intervention design, this peer-led sharing of individual successes proved very useful for VHTs who had struggled to launch their Village Health Clubs, as they felt encouraged and/or challenged by their colleagues' successes.

" The most significant change I have seen as a result of the Village Health Club is a reduction in the number of cases treated in the village for malaria and diarrhoea. People have been equipped with knowledge to prevent themselves against diseases. When I move around in the village, I see homesteads have improved in cleanliness. They have put up latrines and drying racks and are boiling drinking water. Even when their children fall sick they know what to do. My workload is becoming less and I can manage to do my other work. "

VHT, Masindi district

Community uptake of Village Health Clubs

Between September 2013 and February 2014, extensive data were collected from VHTs and their supervisors in order to evaluate the process of implementing the Village Health Clubs and communities' uptake of the intervention. Data were collected through questionnaires filled in by VHTs attending progress review meetings, representing 415 Village Health Clubs.

In addition, research assistants who had undergone a two-day training in the study's objectives, concepts and tools conducted qualitative key informant interviews with 24 VHTs and eight VHT supervisors. The qualitative data were analysed using a thematic content data analysis approach.

The research assistants collected a total of 63 field stories from VHTs – across both inSCALE interventions in Uganda – to be used in the Most Significant Change evaluation methodology. This is a form of participatory evaluation that involves many levels of stakeholders, who rank the changes they consider most important for the programme, along with justifications for the ranking.

For inSCALE, three rounds of reviews of the stories took place, in which the organisational, district and national stakeholders went through systematic selection of the most significant stories, providing qualitative data on impact and outcomes to use to assess programme performance as a whole.

Following VHT training, 96 percent of the villages had established Village Health Clubs; 59 percent of the clubs were still active nine months later. The process evaluation showed the majority of clubs had between 21 and 50 members, predominantly female, with monthly or bi-monthly meetings dealing mostly with the prevention and treatment of malaria, diarrhoea and pneumonia.

After the clubs had been rolled out for 18 months, an endline survey was conducted, which visited over a thousand households. Of these, about every third household had participated in the club activities.

Lessons learnt

Successes

Data collected from the progress review questionnaires and 32 key informant interviews conducted in the community intervention revealed predominantly positive feedback, especially regarding VHT motivation and performances. Key responses are presented on page 19.

In addition to the indicators directly addressing the desired outcomes of the inSCALE community intervention, VHTs and their supervisors reported a number of other key successes:

- Village Health Clubs have greatly reduced VHT supervisors' workload, both at health facility level, owing to reduced patient load, and at community level, as the clubs are performing health education and sensitisation. Additionally, the clubs have eased the information flow to communities for meetings and outreach activities.

- Village Health Clubs have contributed to communities' economic empowerment through the evolution of the clubs into community-based organisations and establishing saving and credit cooperatives (SACCOs) and income-generating activity groups.

" The VHC members are doing most of the work by following what they agree on in their meetings. As a supervisor, I used to be alone in this work, but now we are many and work as a team, and my work is reducing tremendously because of this team work.

VHT supervisor, Kyegegwa district

" I supervise 12 VHTs who have all formed active clubs. These VHTs have formed a SACCO with the aim of benefiting from the government National Agricultural Advisory Service programme. "

VHT supervisor, Masindi district

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Outcome	Indicator	Testimonials
Improved VHT status and standing	Village Health Clubs have improved sanitation and hygiene in the communities, which has reduced rates of disease, especially diarrhoea and malaria, through preventative behaviour. Where attributed to the efforts of the VHT, this greatly impacts his/her standing in the community.	"The Village Health Club has made VHTs more popular in the communities they serve because there is direct interaction between them and the community, and the action plans that are agreed on greatly impact the community if properly implemented. So, after the community members get the desired result, they appreciate the work of VHTs and look at them like real doctors. This has elevated their status in the community and people look at them with a lot of respect and admiration." VHT supervisor, Masindi district
Improved VHT support and supervision from the community	The majority of VHTs and supervisors felt the Village Health Clubs had increased appreciation and respect for, and recognition of, VHTs in the communities. VHTs are more widely known, and there is an increased awareness and understanding of their role and responsibilities. In addition, the clubs have resulted in improved relations with village government and religious leaders, and strengthened relationships with community members.	"In some villages, community members have appreciated VHTs and contribute some money to help VHTs access some basic needs at home, since they spend most of their time doing voluntary work. This is a sign communities have recognised the efforts of VHTs in trying to improve the health of their communities and have in turn appreciated their work." VHT supervisor, Masindi district
Increased VHT feeling of connectedness to the community	The majority of VHTs and supervisors felt the Village Health Clubs had increased appreciation and respect for, and recognition of, VHTs in the communities. VHTs are more widely known, and there is an increased awareness and understanding of their role and responsibilities. In addition, the clubs have resulted in improved relations with village government and religious leaders, and strengthened relationships with community members.	"The Village Health Clubs have tried to change community expectations towards the VHTs. Some community members now understand VHTs are volunteers, who need to be respected for the good work they are doing for the community." VHT supervisor, Hoima district
Increased VHT performance and motivation	The Village Health Club flipbook (facilitator's guide) has increased VHT knowledge and skills on disease management and prevention, positively impacting the quality of service provision. The clubs and facilitator training have improved VHT public engagement skills, helping them to manage large crowds and people of different backgrounds. When giving health education to one attentive group as opposed to individual household visits, VHTs are using their time more efficiently. The reduced workload in turn frees up time for the VHTs, which the formative research identified as a great motivator.	"I have learnt a lot from using the flipbook. The pictures in the flipbook are very direct and the steps we follow during club meetings have also enlightened me about the prevention of diseases." VHT, Masindi district

"In the past, I would spend a lot of time moving around the village at the expense of my work that pays me, but now people come together and I facilitate at once. The work I would do in a month is done in one day when all people come to the meeting." VHT, Kyegegwa district |
| Increased access to and use of appropriate treatment | Village Health Clubs have led to greater understanding of and appreciation for the VHTs' roles and responsibilities as well as limitations. This has, in many cases, increased demand for and uptake in VHT services, better adherence to referrals and improved early treatment-seeking behaviour. | "In the past, people believed in witchcraft. A caregiver would have a child suffering from diarrhoea and claim it was witchcraft. But, with sensitisation from the Village Health Clubs, members now bring their children to the VHT for treatment, and when we refer them to the health centre they go and seek treatment, unlike in the past, when they would go to buy drugs from the clinic instead." VHT, Buliisa district |

Challenges

Where Village Health Clubs were not successful, the main challenges defined by the VHTs in starting and running the clubs include:

- A lack of interest from the community – in particular from youth and men – in attending the Village Health Clubs, despite repeated mobilisation efforts by the VHTs.

- Inadequate stationery supplies to run Village Health Club meetings affected attendance and membership – in particular membership cards running out.

- Community members expecting allowances, lunch and/or free items such as t-shirts and mosquito nets would be demotivated from attending meetings.

- There was a lack of support from local leaders in mobilising for and attending meetings and signing membership cards.

- In periods of drug shortages, club meeting attendance drops significantly.

- With no facilitation for supervisors, VHTs largely run the clubs with minimal supervision. The designed supervision structure did not work as intended, largely because of a lack of facilitation. Although the VHT–community supportive supervision mechanism exists in the clubs, VHTs felt the need for more formal and traditional support supervision from district supervisors.

- Drop in attendance and activities during festive periods and planting/harvest seasons, as well as other community events like burials and weddings, affected attendance.

- Income-generating activities and the need to care for relatives can take priority over club activities, especially in villages with only one active VHT, running the club alone.

- Larger villages and migratory populations pose challenges for VHTs in carrying out continuous mobilisation, given the time-consuming nature of recruiting new members and following up on club-agreed activities in this setting.

- Some Village Health Clubs stopped organising meetings when they ran out of topics suggested and illustrated in the inSCALE flipchart and picture cards.

"In the past, you would find me on my bicycle, carrying three children at a time to the health centre. Things were not good in my home. I have eight children, and there was a lot of vomiting and diarrhoea. Through the club I was inspired to build a drying rack and a latrine. Now there is no more diarrhoea."

Bahoire Oliver, member and chairperson of Kisongi Village Health Club, Buliisa district
Photo: Tine Frank

Conclusions and recommendations

1.

The Village Health Club intervention, when the key elements are in place, can be an effective approach to achieving behaviour change, while strengthening and supporting the role of the VHT. Furthermore, the clubs can be used as platforms for other community education and empowerment initiatives – either by the community themselves or for non-governmental and government initiatives. By linking the clubs to income-generating activities, the clubs are more likely to become self-sufficient.

2.

Although the community-to-VHT supervision structure offers some support to the VHT, it is recommended that Village Health Club support and supervision be integrated into district and sub-county development plans and budgets to further strengthen the VHTs as key health assets and the Village Health Clubs as community solutions to child health challenges. It is, however, important to note that the Village Health Clubs were formed and remain active even where VHTs received little or no sub-county-level supervision, speaking to the potential sustainability of the intervention.

3.

Incorporating peer-to-peer learning sessions for VHTs during district review meetings significantly boosted club formations, membership and activities, and fostered a sense of connectedness and community among the VHTs. They were particularly useful for VHTs struggling to form or maintain clubs, as they would learn good practices from colleagues running active and successful Village Health Clubs.

4.

Planning for tools and elements to be in place is essential for the successful rollout of the Village Health Club intervention. Simple things such as an adequate stationery supply are vital in retaining and recruiting club members; club membership cards proved key in recruiting new members and many Village Health Clubs, despite efforts to guide the VHTs in making new copies facilitated by the club itself, experienced difficulties in attracting new members when they ran out of cards.

5.

To keep the Village Health Clubs active in the longer term, linkages should be made to future projects, tackling other health issues such as maternal health and neglected tropical diseases to continue community education on other health topics. To support this, additions could be made to the existing flipbook.

6.

When scaling up the intervention, it is important to consider workload. With more VHTs per village trained as Village Health Club facilitators, the workload – especially mobilisation and follow-up – will lessen for the individual VHT, which will furthermore make club activities less reliant on VHT availability. With a workload more manageable for the VHTs, the intervention is more likely to sustain.

7.

Peri-urban areas did not respond well to the Village Health Club concept, whereas rural communities tended to embrace the concept more willingly. The suggestion is that the need for VHTs in peri-urban areas is likely to be different to that in rural areas. Further research would determine whether the Village Health Clubs can still provide a mechanism through which VHTs can sustain their motivation if these needs are identified and solutions to them are led by community members.

Moving forward

Beyond the project life of inSCALE in Uganda, Malaria Consortium is continuing to share lessons and findings from the Village Health Clubs with interested and relevant partners and stakeholders.

1.

Malaria Consortium is providing support to iCCM and technical assistance to the MoH, and participates in appropriate technical working groups. As the MoH is revising its iCCM strategy, Malaria Consortium is sharing lessons from the inSCALE community intervention and encouraging the uptake of the Village Health Clubs.

2.

Malaria Consortium will continue to introduce Village Health Clubs in other parts of Uganda, with additional learning materials included on neglected tropical diseases and maternal health.

3.

In and beyond the Uganda context, lessons learnt from the Village Health Club intervention are being incorporated into Malaria Consortium's social mobilisation activities in other countries, with plans to strengthen Community Health Committees in Mozambique by adding social identity and social group theories to how they work with CHWs and communities.

Malaria Consortium continues its efforts to share learning more broadly, for example by making available the Village Health Club implementation package, training-of-trainers manuals, etc. to other organisations interested in replicating the intervention model, as well as facilitating exchange visits for other implementers of this or similar interventions.

As final findings are being analysed, Malaria Consortium will publish a final endline paper to establish the actual impact of the Village Health Club intervention in Uganda, including costing the intervention and its various components.

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Malaria Consortium

Malaria Consortium is one of the world's leading specialist non-profit organisations. Our mission is to improve lives in Africa and Asia through sustainable, evidence-based programmes that combat targeted diseases and promote child and maternal health.

We work across Africa and Asia with communities, government and non-government agencies, academic institutions, local and international organisations, to ensure good evidence is used to improve delivery of effective services.

Our uniqueness is in our ability to consistently design and apply tailored, technically excellent, evidence-based solutions, fit for effective implementation, with impact on the wider health system and economy.

Malaria Consortium works with partners, including all levels of government, to improve the lives of all, especially the poorest and marginalised, in Africa and Asia. We target key health burdens, including malaria, pneumonia, diarrhoea, dengue and neglected tropical diseases (NTDs), along with other factors that affect child and maternal health. We achieve our goals by:

● Designing and conducting cutting edge implementation research, surveillance and monitoring and evaluation.

● Selectively scaling up and delivering sustainable, evidence-based health programmes.

● Providing technical assistance and consulting services that shape and strengthen national and international health policies, strategies and systems and build local capacity.

● Seeking to ensure our experience, thought leadership, practical findings and research results are effectively communicated and contribute to the coordinated improvement of access to and quality of healthcare.

www.malariaconsortium.org

Village health team members show community members the importance of sleeping under mosquito nets through drama.
Photo: Tine Frank

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9.3 Implementing mHealth solutions to improve community health worker motivation and performance: DfID learning paper 2016

LEARNING PAPER

Implementing
mHealth solutions

[To improve community health worker motivation and performance]

inSCALE
Innovations at Scale for Community Access and Lasting Effects

malaria
consortium
disease control, better health

About the learning paper series

Since starting operations in 2003, Malaria Consortium has gained a great deal of experience and knowledge through technical and operational programmes and activities relating to the control of malaria and other infectious diseases.

Organisationally, we are dedicated to ensuring our work remains grounded in the lessons we learn through implementation. We explore beyond current practice, to try out innovative ways – through research, implementation and policy development – to achieve effective and sustainable disease management and control. Collaboration and cooperation with others through our work has been paramount and much of what we have learned has been achieved through our partnerships.

This series of learning papers aims to capture and collate some of the knowledge, learning and, where possible, the evidence around the focus and effectiveness of our work. By sharing this learning, we hope to provide new knowledge on public health development that will help influence and advance both policy and practice.

www.malariaconsortium.org/learningpapers

A community health worker in Uganda receives training for using the mobile phone support system.
Photo: Tine Frank
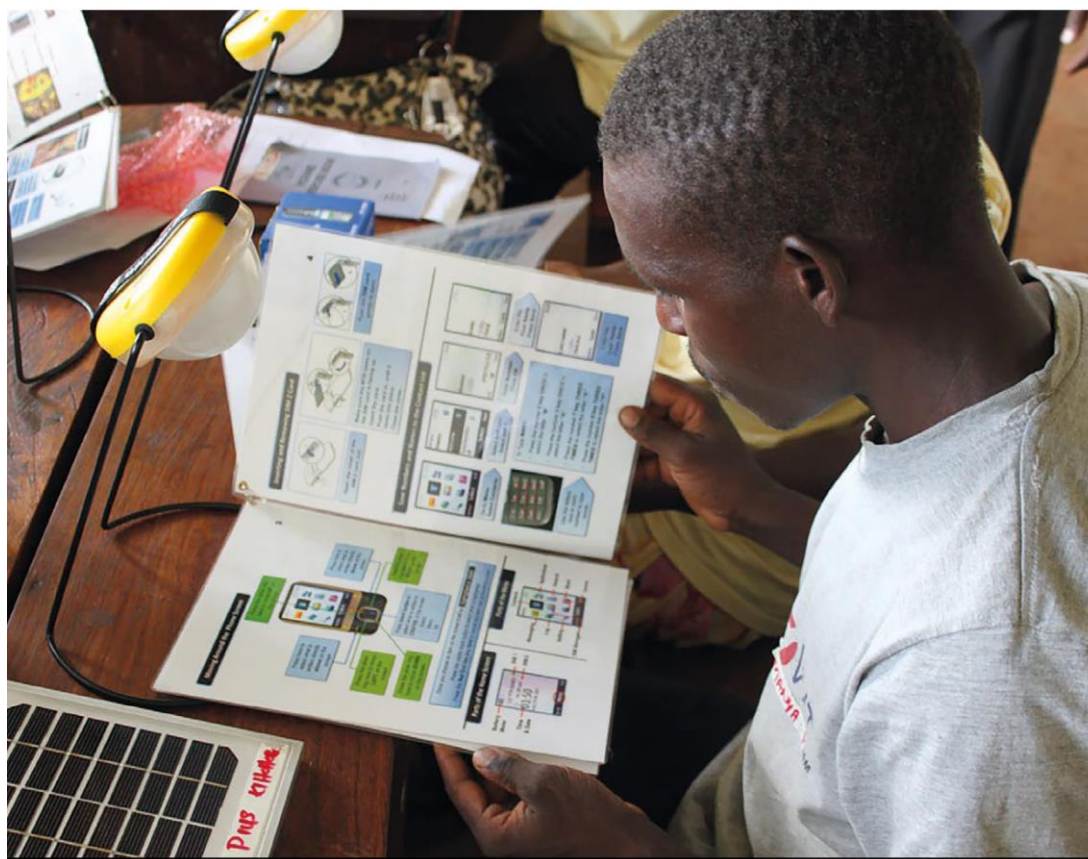
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Executive summary

Malaria Consortium's inSCALE project has been working to scale up quality integrated community case management programmes to improve child health in Uganda and Mozambique. This Learning Paper details the process of establishing mobile health (mHealth) interventions in Uganda and Mozambique, to improve community health workers' (CHWs) motivation and performance, as part of the 'technology intervention' arm of the inSCALE project.

Using a theoretical review method and formative research, the project identified that interventions supported by information and communications technology could facilitate easy communication, provide context-specific technical support, and increase community health workers' (CHWs) connectedness to the health system. Such interventions were found to be acceptable to CHWs and likely to increase their motivation, performance and retention.

Based on inSCALE's formative research, potential components of a technology intervention that would be of value to CHWs were assessed to develop an innovative mobile phone software and feedback system. Because CHWs in Uganda and Mozambique have distinct needs and work in contrasting settings different intervention packages were implemented in the two countries.

The technology interventions were implemented through a process of stakeholder discussions, developing and testing job aids and training of CHWs (1,277 in Uganda and 132 in Mozambique) using the training-of-trainers approach. A series of follow-up activities ensured maximised and correct use of the inSCALE mobile systems.

To understand the challenges and successes of the interventions, regular progress reviews and process evaluations were conducted in both countries. The results showed increased communication between CHWs, their peers and supervisors, and that data submission and receiving feedback messages were highly motivating to CHWs. However, at full implementation strength, the reporting rate rarely reached more than 50 percent in Uganda. In Mozambique, where there were fewer technical challenges which were more quickly resolved, the reporting rate remained at 60-70 percent during full implementation strength.

The majority of the challenges faced owed to software and network issues, but they also included hardware issues and medicine stock-outs. To address these challenges, Malaria Consortium recommends contracting software partners with experience in mHealth initiatives, using an easily customisable platform and choosing tailor-made network provider packages to retain control of service adjustments.

Malaria Consortium continues to engage with mHealth partners in Uganda to determine how components of the inSCALE technology arm can be incorporated into other systems. The organisation is also working with partners in Mozambique to scale up the inSCALE technology intervention, and is in the process of handing over the system to the Ministry of Health.

The inSCALE Learning Papers

As part of the project's advocacy and communications components, inSCALE aims to promote 'coherent and coordinated policies' to advance best practices and innovations to improve CHW programmes delivering iCCM at country level. In support of this, inSCALE has been capturing knowledge and learning from the implementation of inSCALE interventions and sharing these through Learning Papers. Three complementing inSCALE papers have been published:

Developing intervention strategies [to improve community health worker motivation and performance] (2012), documents inSCALE's research and intervention design process.

Establishing Village Health Clubs [to improve community health worker motivation and performance] (2015) summarises knowledge and learning from the implementation of inSCALE's community intervention in Uganda.

Implementing mHealth solutions [to improve community health worker motivation and performance] (2015) documents implementation of the inSCALE technology intervention in Mozambique and Uganda.

To read the Learning Papers: www.malariaconsortium.org/inscale

Introduction

When two-year-old Letitia came down with a fever, her mother, Autilia, carried her to their community health worker, Marcelino. Using his inSCALE smartphone, Marcelino entered the details of Letitia's symptoms and received instructions through the inSCALE APE CommCare application to carry out a malaria test. The test indicated no malaria parasites, and Marcelino prescribed paracetamol to bring down the fever. He then played a pre-recorded message about fever to Autilia.

Relieved that she did not have to walk the two hours to the health centre, Autilia said, "This is why I like to come here for treatment."

Community health worker, Marcelino, follows instructions on his inSCALE phone to diagnose Letitia
Photo: Ruth Ayisi

About the inSCALE project

The Innovations at Scale for Community Access and Lasting Effects (inSCALE) project was a five-year multi-country study in Uganda and Mozambique funded by the Bill & Melinda Gates Foundation. Malaria Consortium conducted the project between 2009 and 2014 (and extended to 2016 in Mozambique) in partnership with the London School of Hygiene & Tropical Medicine and University College London.

The aim of the project was to demonstrate that government-led integrated community case management (iCCM) programmes in two African countries could be scaled up while maintaining quality of care by addressing the barriers to iCCM implementation, namely the lack of supportive supervision and community health worker (CHW) motivation. This would be achieved by:

1.
Identifying best practices and innovations with the potential to increase CHW motivation and supportive supervision.

2.
Assessing the feasibility and acceptability of these innovations among different user groups.

3.
Evaluating the impact of the innovations through randomised controlled trials.

4.
Costing iCCM implementation and the innovations.

5.
Promoting the implementation and spread of iCCM by sharing findings and best practices with key national and international stakeholder.

Learning Paper **3**

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Integrated community case management

Integrated community case management (iCCM) is an approach whereby community health workers (CHWs) are trained to identify and treat pneumonia, diarrhoea and malaria in children under five years, as well as to refer severely ill cases to the nearest health facility. Evidence from African countries shows that CHWs, if properly trained and equipped, have the potential to reduce child deaths from these sicknesses by up to 60 percent through the delivery of iCCM[1].

However, iCCM programmes have faced challenges in scaling up. The Bill & Melinda Gates Foundation, through a series of consultations with country programme managers and development partners, identified three main implementation barriers to iCCM: lack of supportive supervision; weak CHW motivation – through remuneration or otherwise; and lack of monitoring and evaluation data for programme planning.

Developing the intervention strategies

Step 1
Existing experience and theory
- Literature review
- History and context reviews
- Expert consultations

Step 2
Creating interventions informed by theory
- 'Best bets'
- Pile sorting
- Formative research

Step 3
Materials and monitoring tools
- Pre-testing of materials

Between January 2010 and August 2012, through a rigorous research, review and evaluation process*, the inSCALE project developed two intervention packages that were evaluated through randomised controlled trials.

Both intervention arms were compared with control arms that received the standard Ministry of Health iCCM package, implemented with support from Malaria Consortium[2].

The two interventions were:

1.
The 'technology intervention'**
Implemented in Uganda and Mozambique, the intervention promotes CHW learning and support. This approach aimed to use low-cost technology through the development of tools and applications for mobile phones, to increase CHWs' feeling of connectedness to the wider health system. The mobile phone software developed by inSCALE promotes CHW motivation and performance through job aids that support decision-making, data submission and performance-related feedback.

2.
The 'community intervention'***
Implemented in Uganda, the intervention promotes CHWs as key village health assets to improve motivation and performance. This community-mobilisation approach focused on the formation of Village Health Clubs as a platform for participatory and locally-owned identification of health problems and solutions, followed by a learning and action cycle.

* This is described in detail in the Learning Paper 'Developing intervention strategies to improve community health worker motivation and performance', www.malariaconsortium.org/resources/publications/167/
** This Learning Paper focuses on inSCALE's technology intervention
*** For more information, see the Learning Paper 'Establishing Village Health Clubs to improve community health worker motivation and performance'. www.malariaconsortium.org/resources/publications/628/

Uganda and Mozambique were selected for implementation of the inSCALE project because both countries:

- were among four countries where Malaria Consortium had implemented an iCCM programme between 2009 and 2012;
- have shown a willingness to commit to community-based care as a way of reducing morbidity and mortality in children under five years;
- have different models of community-based health delivery; and
- have demonstrated its ability to be regional leaders in this field.

In both countries, inSCALE's in-country assessments identified an urgent need for strategies that improve performance, motivation and retention of CHWs in order to successfully scale up iCCM programmes that provide high-quality care to sick children.

Uganda
In Uganda, where CHWs are known as village health team members (VHTs), iCCM became a nationwide strategy for reducing child mortality in 2010. Under this programme, each village was required to have an average of five VHTs, two of whom have been trained to distribute medicines under iCCM. There are no literacy or education requirements, although ideal candidates are able to read and write the local language. VHTs receive five days of basic health training, with six days of additional iCCM training for the iCCM VHTs.

VHTs in Uganda are volunteers, receiving US$5 a month to cover travel costs, and have an average catchment population of 250 people. Treating children aged two months to five years, a VHT typically sees 20 cases per month.

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Mozambique

In Mozambique, the programme for CHWs, who are locally known as *agentes polivalentes elementares* (APEs), has been in existence for more than 30 years.

In contrast with VHTs in Uganda, APEs are required to have completed primary education (minimum Grade 4), and to know basic maths and speak Portuguese. APEs are trained for four months, using a curriculum with three modules, one of which is iCCM. On completion of training, APEs spend two weeks working at a health facility. APEs receive a monthly stipend of US$40 and cover on average a catchment population of 2,000 to 2,500 people. They provide iCCM for malaria, pneumonia and diarrhoea for children aged 2-59 months and detection and referral for acute malnutrition cases, newborns and pregnant women with danger signs.

In 2014, TB and HIV treatment adherence counselling, provision of contraceptives and provision of misoprostol for post-partum haemorrhage were added to the APE curriculum. Health promotion activities are an integral part of the APE work and should comprise 80 percent of activities.

Typically, an APE sees more than 100 patients per month, of whom nearly half are children under five years. Compared with VHTs in Uganda, APEs cover a larger area as households are spread out, requiring considerable travel time and transport costs.

Community health workers in Uganda and Mozambique

Uganda	Mozambique
Village health team members (VHTs)	**Agentes polivalentes elementares (APEs)**
● No minimum educational requirements (preferably able to read and write)	● Minimum Grade 4
● 5-11 days' training (iCCM training 5-6 days)	● 4 months' training (iCCM training 4 weeks)
● Volunteers	● Receives monthly stipend ($40)
● Catchment population of 250 people	● Catchment population of 2,000-2,500 people
● Only treats children under 5 years	● Treats all age groups
● Sees 20 cases/month	● Sees 116 cases/month
● inSCALE area: 3,036 VHTs/1.2 million population	● inSCALE area: 275 APEs/1.8 million population

CHWs in Uganda and Mozambique differ in terms of their caseload, training and coverage. Therefore, the intervention packages were designed differently in the two countries.

In Uganda, a community intervention, in addition to a technology intervention, was seen as valuable. In Mozambique, only the technology intervention was implemented due to time constraints and because community components already existed in the national APE strategy through established community health committees.

The technology intervention – referred to as the inSCALE VHT mobile phone support system in Uganda and the inSCALE APE CommCare application in Mozambique – differed in the two countries. In Uganda, a simple feature phone was used; and a smartphone allowing the use of applications with added features was used in Mozambique.
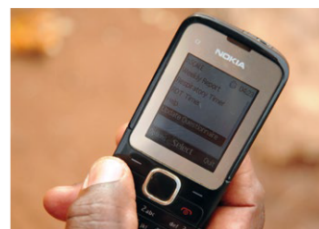
The inSCALE VHT mobile phone support system in Uganda

The inSCALE APE CommCare application in Mozambique

Designing the inSCALE technology intervention

A growing body of evidence demonstrates the potential of mobile communications to improve healthcare services, even in the most remote and resource-poor environments. inSCALE's theoretical review and formative research indicated that information communications and technology-supported interventions could facilitate easy communication, provide context-specific technical support and bring about connectedness to the health system. In addition, such interventions would be feasible and acceptable to CHWs in Uganda and Mozambique and would likely increase CHW motivation, performance and retention.

What is mHealth?

Mobile health or mHealth is a medical or public health practice that is supported by portable devices, such as mobile phones and tablets[3].

The inSCALE technology intervention

Formative research	Intervention design
CHWs are motivated by their status and standing in the community.	Owning a smartphone or feature phone – which is branded as inSCALE and marked with an individual code to identify each CHW – will add to the CHWs' status and standing in their community.
CHWs value technical feedback and supportive encouragement.	Software developed to provide regular and individual performance-based feedback and encouragement messages will be greatly motivating to CHWs. Performance data sent to supervisors allows them to provide targeted feedback and remote supervision.
Feeling connected to the health system motivates and validates the CHWs in their role.	Software developed to ease report submission and feedback, as well as facilitating regular and free calls between supervisors and CHWs, will create a feeling of connectedness to the health system.

In Mozambique, the APE programme was relaunched in 2010 resulting in new recommendations in the Ministry of Health's iCCM policy. inSCALE adjusted its implementation in Mozambique to a later date to allow time to incorporate these recommendations.

The intervention was therefore implemented in Uganda first, and the lessons learnt were applied to the implementation in Mozambique. Consequently, the formative research that informed the design of the intervention in Mozambique was focused on how to tailor the intervention to the Mozambique audience[4].

Components of the inSCALE technology intervention

During the formative research, potential components of a technology intervention that would add value to CHWs' performance and motivation were weighted and assessed. Following selection of the components, an innovative mobile phone software and feedback system was developed, which is outlined in detail here. When combined, these components have the potential to influence CHW motivation, performance and retention.

Intervention Components

| CHW receiving monthly motivational SMS | CHW submitting data using phones and receiving personal performance related feedback | CHW and supervisor using Closed User Groups for remote supervision, planning supervision visits, problem discussion and solving | CHW data on server triggering SMS alerts on good and bad performance to supervisor with hints on which action to take |

Provision of affordable mobile phones and solar chargers

Drivers of motivation

| Standing, status, identity and value | Support and community supervision | Connectedness to the community |

Expected outcomes
CHW performance and motivation

Access to appropriate treatment through:
Increased health behaviour of families
Availability, functionality, visibility of VHT

Use of appropriate treatment for sick children

The inSCALE technology intervention

Affordable mobile phones

The provision and use of mobile phones with the inSCALE software was intended to increase the status of the CHWs in their communities. It would allow for frequent feedback and support from supervisors and peers and promote connectedness to the health system – key factors which were identified as motivating for CHWs.

In Mozambique, the formative research showed a need for a multimedia job aid to assist APEs; this required the use of a smartphone. A Samsung Galaxy Y android smartphone was the device chosen based on cost, operating system, user-friendliness, durability, battery life, weight, screen type, data transmission provision and provision for user-specific applications.

In Uganda, as VHTs were already using job aids in hard copy, a phone with simple features was used. The device chosen was a Nokia C2-00 phone with a dual sim card; this type of phone was more familiar to VHTs, was considered user-friendly and had a longer battery life.

Closed user groups

Closed user groups (CUGs) allow for free, unlimited calls within the network for CHWs and their supervisors. It promotes increased frequency and quality of contact between CHWs and their supervisors, as they do not need to worry about costs and calls being disconnected when credit runs out. As such, the CUGs enable remote supervision, planning of supervisor visits, discussion and problem solving. The CUGs also help minimise the time CHWs spend collecting drugs from health facilities by allowing them to confirm stocks beforehand. Having a phone available and being able to make free calls is likely to improve referral adherence, as CHWs can call the health centre in the presence of the caregiver.

In Mozambique, additional guidelines on phone use for APEs were introduced. This was to address concerns of some supervisors that APEs would use the CUGs to contact them for issues not related to their work.

Solar products

In order to keep inSCALE's technology intervention cost-free for CHWs, a solar charger and lamp were provided. The solar lamps enable CHWs to treat patients at night and improve their working conditions at night. The solar chargers, mainly used to charge the inSCALE phones, also presented potential to generate income for CHWS. As the chargers had a six-pin adapter, CHWs are able to utilise it to offer phone-charging services to the community.

In Uganda, where VHTs welcomed this opportunity, guidelines were developed on how to generate an income from the solar chargers.

In Mozambique, however, APEs did not feel they could ask community members to pay for this service.

Motivational messages

Upon submitting their reporting data, CHWs receive automated feedback through personalised SMS messages, which acknowledge them for their work and highlight its importance in their context. CHWs also receive automated motivational messages monthly. These provide guidelines, advice and other information relevant to their work. Through performance data analysis, weak areas that need reminders or refresher trainings are identified. Motivational messages are developed based on this, and using language that would positively impact on CHW performance and motivation.

In Mozambique, supervisors also receive monthly motivational messages, to address the formative research findings of low motivation among supervisors. In Uganda, this was not highlighted as an issue.

Job aid software

In both countries, the inSCALE mobile phones are programmed with a respiratory rate timer to facilitate improved detection of pneumonia symptoms, as well as a timer for performing malaria rapid diagnostic tests (mRDTs).

In Mozambique, an audiovisual step-by-step guide, based on existing job aids and tools, is included in the inSCALE APE CommCare application. This was to address findings from the formative research that iCCM job aids were not used effectively by APEs.

The application was designed to take the APEs through each step of a consultation, to ensure that APEs do not miss the danger signs or symptoms of malaria, diarrhoea and pneumonia. Once all the steps are completed, the application provides counselling and guidance for treatment. Images and audio in Portuguese are used in the application to refresh APEs skills to identify and treat illnesses, and to reinforce messages to caregivers regarding prevention and treatment. The application is also used to identify danger signs in newborns and pregnant women, as well as guiding malaria treatment in adults.

In Uganda, VHTs are already equipped with laminated job aids that are considered user-friendly and are widely used for the identification, classification and treatment of illness symptoms. A multimedia job aid, therefore, was not added to the mobile phone software as it was not considered likely to enhance CHWs' performance.

Competency checklists

Competency-based checklists were developed to allow supervisors to observe, provide feedback, support and coach CHWs in their work by rating their proficiency over time across five competency areas:

1.
Correctly assess, classify, refer, treat and report all iCCM patients under five years.

2.
Give caregivers accurate referral, treatment and prevention counselling.

3.
Use the mobile phone to send weekly patient reports.

4.
Use the mobile phone to send accurate stock balances of medicines and supplies.

5.
Follow the mobile phone and solar charger usage policies and guidelines.

In Uganda, supervisors were trained to conduct competency-based supervision using paper checklists. In Mozambique, the checklists were programmed into a supervisor CommCare application, allowing supervisors to fill in and submit proficiency to the central server for performance monitoring over time.

Data submission

The inSCALE mobile phone software collects aggregated community patient data – such as number of patients treated, births and deaths – as well as CHW drug stock levels and, in Mozambique, the number of community health talks (palestras) conducted. This data is submitted to a server on a weekly basis. It is made accessible online to district statisticians for forecasting and to use to integrate into regional and national health information systems.

In Mozambique, using a smartphone that is capable of more advanced features allows for individual patient data to be submitted in real time to a server using a 2G or 3G network.

Performance alerts

Automated messages from the server flag up any problems or strengths in the data submitted by the CHWs. These messages are sent to supervisors and alert them on which CHWs require more support and supervision.

In Uganda, simple performance benchmarks were developed to generate automatic SMS messages to send to the health facility supervisor. The software triggers these messages when data submitted show discrepancies – for example, in the total number diagnosed with a sickness and the total number treated for the same sickness.

In Mozambique, the smartphone allows for data submission to the health facility and district supervisors via email in an accessible reporting format. These weekly and monthly reports rate individual CHW performance against five to eight benchmarks based on real-time patient data, such as appropriate management of individual cases. The indicators relevant to a supervisor's catchment area generate information to help with their decision-making and in providing direct and personalised supervision to CHWs.

Learning Paper **9**

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Implementing the inSCALE technology intervention

As implementation timelines were adjusted in Mozambique due to the new iCCM policies, there were benefits in implemeting the intervention in Uganda first. For instance, the lessons learnt from Uganda, combined with the formative research and existing knowledge in Mozambique, helped to speed up the development of the intervention in Mozambique.

In both countries, the implementation period was planned for 18 months. However, in Uganda, the implementation period was reduced to 12 months; this was due to set-up delays largely related to technical issues. In Mozambique, the adjusted timeline resulted in a costed extension up to 2016, allowing for an implementation period of 18 months.

The intervention in Uganda covered 13 sub-counties, 1,277 VHTs and 37 health facility supervisors. A further 13 sub-counties implemented the community intervention, and 13 sub-counties with 879 VHTs served as the control area for both interventions. In Mozambique, six districts implemented the technology intervention, involving 132 APEs and 47 health facility supervisors, and six districts with 141 APEs served as the control area.

The differing numbers of community health workers in each country meant that different approaches were required to establish the interventions in both countries.

In Uganda, more than 50 trainings were conducted for 1,277 VHTs. Due to this large number, it was not viable to deal with individual VHTs experiencing technical issues; instead, supervisors were trained to troubleshoot and VHTs received instructional SMS messages and printed troubleshooting guides.

In Mozambique, there were six APE training sessions, one for each district, held for 132 APEs. The smaller number meant that each APE could be supported directly. However, this became costly and time-consuming. Hence, training on how to resolve phone problems was given to supervisors and district coordinators.

When Yese Muzinguzi's one-year-old son, Peter, fell sick with a severe cough, he brought him to Stephen, their VHT. In this instance, however, Stephen was out of stock of Amoxicillin to treat Peter.

❝ I used my inSCALE phone to call my fellow VHT, to check if she had the drugs, and referred the patient. They took him straight there and Peter was treated and recovered. ❞

Community health worker, Stephen, follows up on a patient he referred using his inSCALE phone.
Photo: Tine Frank

10 Learning Paper

Establishing the inSCALE technology intervention

Activities	Uganda	Mozambique
Stakeholder engagement	Discussions were held with national Ministry of Health representatives, district health teams and other stakeholders, including the United Nations Children's Fund (UNICEF) Technology for Development Department, to produce operation and implementation guidelines. An advocacy and communications strategy was developed to keep key stakeholders engaged and updated on project progress throughout.	Discussions were held with national Ministry of Health representatives and provincial and district health directorate stakeholders to produce operation and implementation guidelines. An advocacy and communications strategy was developed to keep key stakeholders engaged and updated on project progress throughout.
Procurement	A locally-based consortium comprising the companies TTC Mobile (formerly Text to Change) and Scyfy Technologies was sourced to develop and manage the software package. Halfway through project implementation, the contract with TTC Mobile was ended.	An international and locally based company, Dimagi, was sourced to develop and manage the software package. Mcel was first procured as service provider based on network surveys. It was later switched to Movitel due to Movitel's expansion of their services in the first year of implementation.
Phone and server software programming	Scyfy built the inSCALE platform with unique programming and coding (Java Mobile Environment and Ruby on Rails framework).	Dimagi used CommCare, an easily customisable open source platform, used in many countries for CHW programme support, to develop the inSCALE software.
Software content design	Development and pretesting of the broader concept of phone package tools was based on formative research findings. Pretesting of motivational and feedback messages were evaluated on their acceptability, comprehension, and usefulness, and adapted accordingly.	Tailoring and pretesting of motivational and feedback messages were evaluated on acceptability, comprehension, and usefulness, and phone functionalities were adapted accordingly. Email report formats were pretested with supervisors and simplified. A series of action-oriented tips were developed based on a range of common performance-related scenarios.
Job aids and tools	Development, pretesting and finalising were carried out with training guides and DVDs, checklists and job aids in English.	Materials were adapted to Mozambique's context and android phone software, and translated into Portuguese.
District sensitisation	District and community consensus dialogue meetings were held to introduce the technology and community interventions and to seek views on planned innovations from district and community leaders.	District and community consensus dialogue meetings were held to introduce the technology intervention and to seek views on planned innovations from district and community leaders.

Phone software and server programming

In Uganda and Mozambique, the software systems developed for inSCALE were divided into two parts: the 'handset application' and the 'backend'.

Uganda

The '*handset application*' collects and validates data from users, structures a message to the server and then sends it.

The application provides 'network failure' recovery, to ensure VHTs only enter the data once.

It is written in Java, using the Java Mobile Environment (JME) and uses General Packet Radio Service (GPRS) to transfer data to and from the server.

The application is is set up to collect 23 data variables, including weekly number of patients seen, diagnoses, treatments given, referrals made, and drug stock levels.

The '*backend*' is the software that runs on the servers. It processes incoming submissions, presents them to the administrators and generates automated feedback messages to the users.

Data collection forms are fully configurable on the backend and sent to the handset.

The software is written in the Ruby programming language, using the popular Ruby on Rails framework. It has a provision for managing versions of the phone application.

It allows users to make it easier to download new iterations of the software when they are updating their systems.

The software uses an Application Programming Interface (API) to communicate with an SMS system, by receiving messages that are sent to a particular shortcode and sending out messages (usually in response to submitted data or as a triggered message to the VHT supervisor).

Mozambique

In Mozambique, the application developed was built using the CommCare platform. CommCare is an open source mobile health platform that consists of two main elements: CommCare Mobile and CommCareHQ.

The '*handset application*', CommCare Mobile, enables easy electronic data collection, decision support, patient/case management, workflow and behaviour change communication across large numbers of users.

APEs use the mobile application during patient visits as a data collection and educational tool, and it includes audio and image prompts.

The '*backend*', the CommCareHQ web application, provides reports, dashboard analytics, user/domain management, data viewing and performance management analysis to create actionable insight into the collated data.

CommCare uses XForms, a W3C international standard with a significant footprint across mobile platforms that are used in low-resource settings, including OpenXData, EpiSurveyor, JavaRosa and OpenDataKit.

As with the system in Uganda, the data collection forms are also fully configurable on the backend interface and can be sent from there to the handset.

The interface also has a provision for managing versions of the phone application, to make it easier to download new iterations of the software for users when they update their systems.

Deploying the inSCALE technology intervention

Training

The inSCALE technology interventions were rolled out to CHWs through cascade training using a 'training-of-trainers' (ToT) approach. In both countries, the modules covered project concept and objectives, phone and solar product functions, adult training techniques and effective supervision. The CHW ToT module was first piloted and then refined for the final training rounds with groups of 20-25 CHW participants.

Cascade training using a training-of-trainers approach

Uganda

16 MTs → 49 ToTs → 1277 VHTs

Mozambique

7 MTs → 18 ToTs → 132 APEs
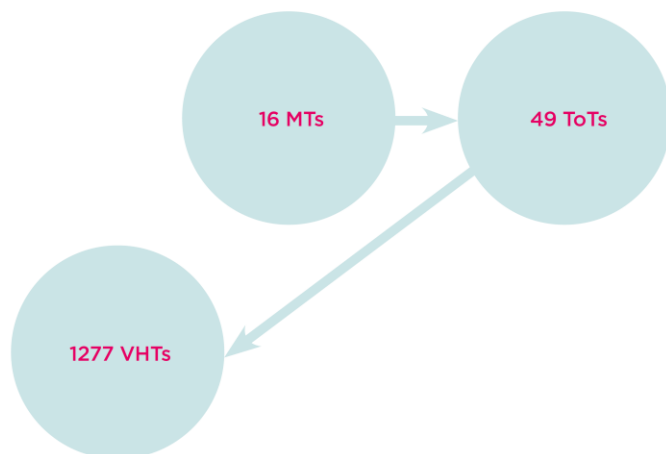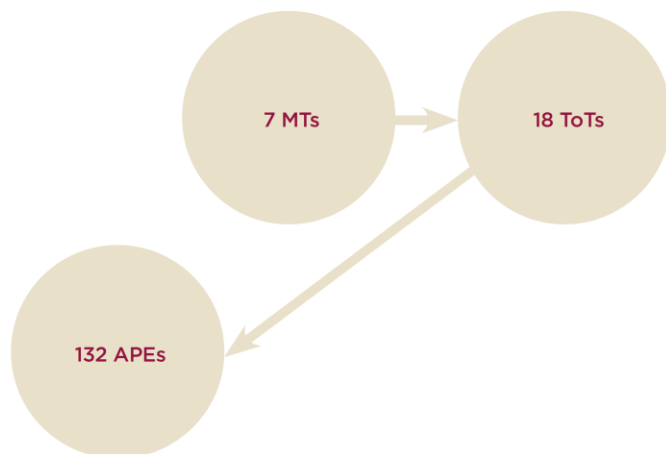
In Uganda, VHTs attended three-day workshops. In Mozambique the APE sessions were over four days to allow time for full training on the multimedia job aids and on how to use a smartphone. In both countries, Malaria Consortium staff supported the master trainers (MTs) to ensure quality of the training. A 'micro teaching' approach was used, dividing the CHWs into small groups of five to seven people, with one facilitator for each group and an emphasis on peer learning.

An important part of the project handover process was dedicated to training in managing and using the inSCALE systems. In Uganda, district biostatisticians were trained to download, manage and understand the data. In Mozambique, the project's extension period allowed for in-depth training of district and province APE coordinators and biostatisticians that focused on enabling government staff to take over the CommCare platform completely, including budgeting, running costs, adding users and downloading data for analysis.

Several training and evaluation tools (in English for Uganda and both in English and Portuguese for Mozambique) were developed for the training sessions. These included individual progress charts, workshop evaluation forms, trainer competency checklists and peer observation forms.

Towards the end of the training sessions, the CHWs were handed their individually branded phones and solar chargers.

Follow-up activities

After the initial rollout of the technology interventions, Malaria Consortium conducted a series of follow-up activities with CHWs to ensure maximised and correct use of the inSCALE mobile systems.

1.
Start up SMS:
Frequent SMS messages were sent to CHWs returning from training in both countries to encourage correct use of phone functions, as well as weekly reminders to submit data.

2.
Refresher session:
Three months after training, early refresher and supervision sessions were held at sub-county (Uganda) and district (Mozambique) level. During the sessions, CHWs provided detailed feedback on their phone use, challenges and successes.

3.
Progress review:
Nine months after training, progress review meetings involving all CHWs were conducted at sub-county (Uganda) and district (Mozambique) level to gather detailed feedback and provide refresher training.

In Mozambique, additional refresher trainings were conducted after 18 months. However, refresher trainings were not provided in Uganda due to the cost of training a large number of participating VHTs.

4.
Data monitoring:
During the early stages of implementation the inSCALE team used the 'backend' systems to analyse submitted data and weekly reports from CHWs.

In Mozambique, this task was gradually handed over to government staff following training of district and province APE coordinators and biostatisticians.

In Uganda, because of time constraints, the inSCALE team solely carried out the analyses. To improve reporting rates, follow-up calls were made to CHWs and their supervisors.

Troubleshooting the inSCALE technology interventions

Implementing mHealth initiatives at community level requires considerable support and troubleshooting. A detailed action plan to address these was prepared for Uganda. This plan was fine-tuned for Mozambique based on local context and the lessons learnt from the Uganda implementation. Focal persons for CHWs to contact directly for troubleshooting were identified within the inSCALE Malaria Consortium team.

Technical issues

A number of challenges connected to network operators needed to be addressed.

In Uganda, where the project used standard service deal packages, these challenges were largely caused by network provider upgrades and technical issues, resulting in all 1,277 SIM cards being changed on two occasions. This upgrade had a very high cost to the project.

In Mozambique, because of poor network coverage from the initial service provider, another company offering a tailor-made service package was used. To upgrade to the new provider's software, SIM cards were changed on one occasion. The mobile operator in Mozambique provided the change of SIM cards at no cost to the project.

System rectification

In Uganda, the number of weekly reports received from VHTs were lower than expected. Therefore, each component of the system, including the internet protocol (IP) address configuration and the server, was assessed. To solve these issues, a new server was set up, data was migrated and the phones were reconfigured.

In Mozambique, minor modifications to the system were made, such as those related to fixing erroneous skips in the software algorithm and misconfiguration of the recipient list for district and health facility reports.

Repairs

After a few months of implementation, both countries experienced a number of hardware problems, partly as a result of the user's mismanagement of the phone and hardware failure. The most common problems were:

- missing or damaged SD cards – which stored the smartphone application – resulting in failure to load the application;
- removing SIM card or battery, resulting in phones failing to synchronise with the server as it changed the system's time setting;
- phone batteries failing to charge or losing power quickly;
- user changing smartphone settings (to keypad or flight mode), making it impossible to type or connect to the internet;
- in Mozambique, phones running very slowly or application failing to open because of old and outdated android software.

Where CHWs experienced hardware faults, the repair process was:

- In Uganda, parish coordinators collected faulty phones from VHTs and delivered them to supervisors. Malaria Consortium staff then collected, repaired, and returned the phones.
- In Mozambique, faulty phones were handed over to health facility supervisors, who delivered them to districts. Malaria Consortium staff then collected, repaired and returned the phones. However, the long travel distances in Mozambique meant this process could take up to six weeks.

In both countries, one of the issues that negatively affected the reporting rate was that the chargers, which were selected for their durability, still broke down, failing to charge the phones. As repairs were not possible, some solar chargers had to be replaced.

Learning Paper **15**

Uptake of the inSCALE technology interventions

Throughout the Uganda implementation, most components of the technology intervention were functional for users, including the mobile respiratory rate and mRDT timers, CUGs and motivational messages. However, the technical challenges from network operators and software partners, along with the extended time to rectify the system, had a negative impact on the success of data submission. At full implementation strength the reporting rate rarely reached more than 50 percent.

In Mozambique, where the technical challenges were less and more quickly resolved, the reporting rate remained at a constant 60-70 percent during full implementation strength. While this was lower than expected, it was partly caused by hardware and connectivity problems and the frequent lack of drug supplies for APEs, leading patients to seek treatment elsewhere.

Uganda

As part of an overall process evaluation, key informant interviews in four sub-counties were conducted with 24 VHTs and eight supervisors. The interviews, held between January and February 2014, explored whether the intervention was implemented as intended and had the desired impact on VHT motivation.

Data submissions on the server were reviewed monthly to evaluate the reporting rate. Nine months into implementation, a survey was conducted with VHTs to collect data on uptake and use of the intervention's components. Qualitative interviews were conducted by experienced research assistants who had two days of training to familiarise themselves with the study's objectives, concepts and tools. Data were manually coded and analysed using a thematic content data analysis approach.

The main findings from the key informant interviews were:

1.
Increased communication with peers and supervisors: 92 percent of VHTs reported having both made calls to and received calls from their supervisors and fellow VHTs using the inSCALE phone and SIM card.

2.
More targeted support supervision to underperforming VHTs.

3.
VHTs found data submission and feedback messages highly motivating: 95 percent of VHTs submitting weekly reports as well as 95 percent having accessed SMS messages.

4.
Solar lamps were helpful for treating patients at night: 84 percent of VHTs reported that they were able to use the solar lamp 'very well' and 75 percent had used them for charging community members' phones.

5.
Improved skills for diagnosing symptoms of pneumonia and malaria: 93 percent of VHTs were reported to be using the inSCALE timers for diagnosis.

6.
Increased recognition of VHT role through phone ownership.

In addition, the research assistants collected a total of 63 field stories from VHTs across both the technology and community interventions in Uganda to use in a 'most significant change' evaluation. This is a form of participatory evaluation that involves many levels of stakeholders, who rank the changes they consider most important for the programme, along with their justifications. The field stories were reviewed in three rounds, in which organisational, district and national stakeholders went through systematic selection of the most significant stories. These stories provided qualitative data on impact and outcomes to be used to assess the project's performance.

Most significant change, Uganda

"The most significant change to me is getting information fast on the phone relating to treatment of children. We easily share information in our work as VHTs, which makes it easier. Even making reports is now easy; we enter data and send the reports using the phone every week. We have a coordinator who calls to ask for reports or to give information and this has made work easy because before we would move to find him.

"We also use the respiratory timer on the phone, which has helped me a lot in my work, because you set it and wait for the alarm to go before you stop counting the breath rate. With the old respiratory timer, it was difficult for me to treat children brought with a cough suspected to be pneumonia.

Many people come for treatment at my place, more than before I got the phone. They call to find out whether I am at home and whether I have drugs, so patients don't delay at my place without getting treatment, so that attracts caregivers to bring their children to me.

The lamp helps me treat patients who come at night. I used to struggle to find money for paraffin when patients were brought at night, but now it is easy because the lamp provides the light when I have to treat at night. I don't spend on paraffin. The lamp is charged under the sunshine so I don't incur any costs to maintain it and it also has better lighting than the local lantern."
VHT, Hoima district

Mozambique

Between May and June 2014, 24 APEs and nine supervisors from three districts were interviewed to evaluate the uptake and impact of the technology intervention in Mozambique. Interviews were conducted by qualitative researchers, who had received one week of training which covered the study's objectives; use, challenges, and adaptation of the interview tools; test interviews; and transcription of audio files.

Focus group discussions with an emphasis on the motivational aspect of the project were held. Data submissions on the server were also reviewed monthly in order to evaluate the reporting rate. Twelve months into implementation, a survey exploring uptake among all APEs in the technology intervention was undertaken to collect data on uptake and use of the intervention's components. In addition, the research assistants conducted three rounds of focus group discussions with 12 APEs, for a simplified version of the 'most significant change' evaluation methodology.

The main findings from the key informant interviews were as follows:

1.
Out of 24 APEs, 20 had used the phone regularly to request help or support from their supervisor.

2.
Out of 24 APEs, 18 had received one or more calls in the past month from their supervisor.

The survey on uptake revealed that nearly 70 percent 'always' used the phone to support their work in the communities and 20 percent used it 'sometimes'. A total of 84 percent had called their supervisor in the previous month, and 98 percent were using the solar lamp for consultations at night.

Lessons learnt

Successes

Data collected from the progress review questionnaires and 65 key informant interviews conducted in both countries revealed predominantly positive feedback, especially regarding CHW motivation and performance. Some key outcomes are below:

Aim	Outcome	Outcome
Improved CHW status and standing	**Uganda** Owning feature phones and solar products is perceived as prestigious and increases respect for VHTs, thus promoting their value to the communities. Owning the phones also underlines the VHTs as being connected to the government health system. "You may find that, out of 100 people in the village, only seven people have phones. So, for a VHT to receive an inSCALE phone, it is really important. Some of the community members may even go to the VHT's home to have a look at the phone, it may sound like a joke, but it is the reality on the ground. To a VHT, having this phone is very prestigious." *VHT supervisor, Kyegegwa district*	**Mozambique** The inSCALE APE CommCare application is seen to enhance community perceptions and the legitimacy of APEs, as well as understandings of their work – improving communication between APEs and their communities. "I am very well known now. People say, 'This lady who works with the phone.' Many people want this phone, and the sick people come running to see the phone." *APE, Inharrime district*
Improved CHW support and supervision	Regular phone contact between VHTs and their supervisors improves supervision, reducing the need for frequent supervisor visits and improving relationships. Underperforming VHTs are identified through submitted data and receive more targeted supervision. "We are now in touch frequently, which was not the case before, when it was always a challenge to get in touch with the VHTs. But now, it is just a matter of calling them." *VHT supervisor, Hoima district*	Regular contact and supervision over the phone improves the level of support APEs receive. The phones improve report submission, which in turn improves the level of targeted support. "Not only does the phone have the advantage of facilitating the right diagnosis and correct treatment, but also it helps us supervisors know how the APE is performing." *APE supervisor, Inhambane province*

Activities	Outcome	Outcome
Increased CHW feeling of connectedness to the health system	**Uganda** VHTs feel appreciated and recognised on receiving motivational and feedback messages, and feel they are part of the overall health system. With government-branded phones, communities also view the VHTs as more connected to the government health system. "I can talk and make consultations with other VHTs, my coordinator and supervisor. This makes me proud because, when I ring anyone on the system, I get a prompt response. I don't even need to first introduce myself." *VHT, Kyegegwa district*	**Mozambique** APEs report that the phone indicates that they are an important part of the health system strengthening effort aimed at reducing the burden of disease in their communities. "When we are given so much support, in the form of this equipment, we realise that we have the capacity to improve our work and contribution as an APE towards the construction of programmes headed by Ministry of Health, as well as the local government. You can't ever imagine or consider that at any moment you will be forgotten. Now more than ever, we are connected." *APE, Inhambane province*

Activities	Outcome	Outcome
Increased CHW performance and motivation	**Uganda** VHTs improve their performance through more correct diagnosis of malaria and diarrhoea using the phone timers, refresher training SMS messages and phone consultations with supervisors and other VHTs through the CUGs. Data required for weekly reports increases household visits for follow-up and registration, as well as the quality and timeliness of the data submitted. Motivational messages provide a feeling of appreciation and encouragement for the VHTs, and the phones and solar products themselves are perceived as a reward for volunteering. "If I get a patient and maybe I have forgotten some procedure to follow I call my fellow VHT to remind me of what I should do to treat the patient. Then I treat confidently knowing what I am doing." *VHT, Hoima district* "The VHTs would not pay much attention to the monthly reports they were writing in the past, but now when they make weekly reports they are careful not to make mistakes because they know they are sending them direct and each of their numbers [VHT's code number] is known. This has also helped them make better monthly reports that they give to the parish coordinators to bring to the health facility." *VHT supervisor, Masindi district*	**Mozambique** The inSCALE phones and the visual job aid provide APEs with opportunities to acquire new skills, and many use the diagnosis and treatment guide, which improves their performance and validates their knowledge among caregivers. "So we have been giving health talks to these mothers for a long time, but then we noticed that often they actually didn't understand these messages. But now, with the phone, they can hear and see for themselves. They really like it. You see, now I can show them that the person is sleeping under a mosquito net, not just tell them." *APE, Morrumbene district* "The phones help the APEs conduct a correct consultation and, at the same time, deliver necessary and correct health education. Before, it was normal for the APE to wrongly diagnose a disease, provide an incorrect treatment or make an unnecessary referral, but now by using the phones this is solved." *Supervisor, Inharrime district*

Activities	Outcome	Outcome
Increased access to and use of appropriate treatment	**Uganda** Caregivers can call the VHTs to check their availability, as well as that of drugs. When not available, the VHT can direct the patient to his/her colleague, resulting in more prompt treatment or referral. VHTs can call in the referral to the health centre in front of the caregiver, which increases adherence to referrals, resulting in more prompt and appropriate treatment. "Imagine when a patient brings a sick child in the night and I tell him or her that 'Please I cannot attend to your child because I do not have the light.' They will go away annoyed. Now, when I work on them, they feel happy and friendly to me, and tell other people that I treated their child in the deep of the night." *VHT, Buliisa districtt*	**Mozambique** The inSCALE smartphones improve the status of the APEs, fostering respect among their community members and increasing the number of community members who routinely approach the APEs for care and advice. The confidence and recognition from their communities is also felt to be an incentive for the APEs. "I remember one time there was a pregnant woman in my community who was in pain for two days. I used my phone to communicate to my supervisor because she could not walk and the supervisor sent an ambulance for her. This happened twice." *APE, Inhassoro district* "Because everything is happening on this phone, this has been helping me prescribe the correct medicine and correct dosage and even to appropriately explain how the mother has to give each dosage to her baby. These recommendations have been easy to deliver, as everything is shown on the phone." *APE, Morrumbene district*

In addition to these outcomes, CHWs and their supervisors reported on a number of other key successes:

- In Uganda, VHTs reported that being able to call the health centre to refer a patient, and making this call in front of the patient, increased referral adherence.

- In Mozambique, the provincial APE coordinator used the WhatsApp messenger platform to establish a group, which included all district APE coordinators and biostatisticians who had received the inSCALE phones, so they could communicate about supervision and other issues. Some APEs have also done the same.

Learning Paper **21**

Challenges

Most of the challenges faced implementing the inSCALE technology intervention owed to software and network issues, but also some hardware issues and human factors. Some key challenges included:

1.

Network access and internet connectivity presented operational challenges in both countries.

2.

Irregular supply of drugs, at times leading to drug stockouts, negatively affected the progress and improvements gained by the intervention.

3.

In Uganda, frequent transfers of health facility supervisors disrupted the improved relationship between CHWs and supervisors.

4.

Some CHWs, due to their low-level of education and geographical location, continued to experience difficulties using the phones.

5.

Both countries experienced significant challenges with regard to software and hardware maintenance as well as functionality issues related to software and platforms.

6.

In Mozambique in particular, it has been a challenge to ensure automatic uploading of data bundles on the CHWs' phones.

7.

Despite being procured as the most durable solar product, the solar chargers are fragile in a rural setting, with the majority not functioning within a few months.

8.

The high level of uncorrected visual impairment among many older CHWs presented a challenge in navigating phone functions easily, particularly on the smartphone.

9.

Challenging partnerships with contracted software partners (Uganda) and network operators (Mozambique) caused significant time delays to the project.

10.

The limited literacy rate among Ugandan VHTs presented a challenge in terms of their understanding and navigation of phone functions.

11.

In Mozambique, a considerable number of APEs unintentionally switched their phones to flight mode, disabling the reporting functions.

Recommendations

For the successful implementation of similar projects, the following recommendations are made to prevent technical issues related to software, hardware, platforms and network providers:

1.

A reliable software partner with experience in mHealth initiatives and who uses an established platform is essential for successful implementation. In Mozambique, partnering with a locally-based agent that met international standards and used an easily customisable platform greatly reduced software-related challenges. A similar platform could not be sourced in Uganda at the time the project started and had to be built from scratch, leading to considerable delays due to troubleshooting and modifications to the software package.

2.

Tailor-made network provider packages, as opposed to standard package deals, are highly recommended. Despite the added time required by operators to tailor packages, this is necessary in order to retain control. As standard package deals change regularly, and mobile operators do not always communicate changes regarding the data and minutes provided, this can cause significant confusion among both the CHWs and the project implementers.

3.

Initiatives such as the inSCALE technology intervention have the potential to generate additional business for network operators. Ministries of Health should capitalise on corporate social responsibility policies to leverage better package deals for data and minutes from operators, as CUGs may be too costly for governments.

4.

In order to deal with considerable technical challenges, it is highly recommended to establish a monitoring system. This would involve training designated staff from either the project or the Ministry of Health to troubleshoot and to conduct a weekly analysis of incoming data. A monitoring system will also help to ensure quality control in reporting and identify users with software or hardware difficulties.

- Phones with non-removable batteries and a significant amount of internal memory (at least 1GB) are preferred so the inSCALE APE CommCare application can be installed without the need for an SD card.
- To ensure correct and relevant use of the phones, it is recommended to install 'app-lockers' in order to prevent using up the paid-for data on other applications not related to the programme.

5.

In Mozambique, many APEs stopped reporting faults to avoid being without a phone for up to six weeks if it needed to be repaired. To maximise the purpose and use of the phone and minimise disruptions such as these, contracts with locally-based repair services for hardware maintenance are essential.

6.

Using the phones can increase CHW performance in terms of managing patients and prescribing treatment. Where data collection using the phones already happens – such as the mTrac SMS-based disease and medicine surveillance system in Uganda – at minimum, components such as CUGs, supervisor messages, and personalised feedback SMS should be incorporated.

7.

Gradual implementation and scale-up is crucial for an mHealth initiative such as the inSCALE technology intervention. Pilot testing the mobile systems helps identify issues early on, improving the success rate when introducing them as routine practice. Lessons learnt from pilot implementation will be highly valuable in making adjustments and improvements before further scale-up.

Moving forward

Uganda

The inSCALE project in Uganda ended in October 2014. Malaria Consortium hopes to engage with partners who are expanding mTRAC in Uganda, to determine how components of inSCALE could be incorporated into the system.

Malaria Consortium is also exploring whether there is interest in incorporating a simple electronic job aid similar to CommCare.

Mozambique

In Inhambane province, Malaria Consortium started the handover process to the Provincial Health Directorate, which continues under the 2016 upSCALE project.

The upSCALE project in Mozambique

Malaria Consortium is collaborating with the Ministry of Health in Mozambique, UNICEF and Dimagi to further develop and integrate the mHealth system and the inSCALE APE CommCare application (now known as the APE app). The mHealth system will be fully integrated into the APE programme and transitioned to Ministry of Health control. This involves training key individuals at national, provincial and district level to manage the mHealth system functions, including monitoring usage and troubleshooting. Initially, this system will be scaled up to include all districts in Inhambane and Cabo Delgado, with further scale-up anticipated in other provinces.

The application will be patient-focused, rather than disease-focused, in order to promote continuous care and follow-up within the community. It will include the APE services that were added to the curriculum in 2014, which are family planning, pregnancy tracking, antenatal care, post-partum care, healthy child check-ups, and tuberculosis and HIV patient follow-up for treatment adherence counselling. Dedicated modules will be developed to assist APEs with stock management, preparation for community health talks, and vital registration. An additional application for supervisors to manage APE performance is also being developed.

Malaria Consortium is also actively involved in the harmonisation of mHealth activities in-country. This includes support to bridge the mHealth system with District Health Information Software 2 (DHIS2), in order to make community data available on the DHIS2 dashboard.

More information about the upSCALE project is available on the Malaria Consortium website: **www.malariaconsortium.org**

Malaria Consortium continues its efforts to share learning more broadly, for example, by making the inSCALE mobile phone system and application freely available through a public copyright license (Creative Commons Attribution-Non Commercial-ShareAlike licence) which can be downloaded from the inSCALE site: **www.malariaconsortium.org/inscale**

Malaria Consortium will publish an endline paper to establish the impact of the inSCALE technology interventions in Uganda and Mozambique, including costing of the interventions and their various components.

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Malaria Consortium

Malaria Consortium is one of the world's leading specialist non-profit organisations. Our mission is to improve lives in Africa and Asia through sustainable, evidence-based programmes that combat targeted diseases and promote child and maternal health.

We work across Africa and Asia with communities, government and non-government agencies, academic institutions, local and international organisations, to ensure good evidence is used to improve delivery of effective services.

Our uniqueness is in our ability to consistently design and apply tailored, technically excellent, evidence-based solutions, fit for effective implementation, with impact on the wider health system and economy.

Malaria Consortium works with partners, including all levels of government, to improve the lives of all, especially the poorest and marginalised, in Africa and Asia. We target key health burdens, including malaria, pneumonia, diarrhoea, dengue and neglected tropical diseases (NTDs), along with other factors that affect child and maternal health. We achieve our goals by:

- Designing and conducting cutting edge implementation research, surveillance and monitoring and evaluation.

- Selectively scaling up and delivering sustainable, evidence-based health programmes.

- Providing technical assistance and consulting services that shape and strengthen national and international health policies, strategies and systems and build local capacity.

- Seeking to ensure our experience, thought leadership, practical findings and research results are effectively communicated and contribute to the coordinated improvement of access to and quality of healthcare.

www.malariaconsortium.org

An APE coordinator uses the inSCALE APE CommCare application to refer a patient in Inhambane, Mozambique.
Photo: Ruth Ayisi

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9.4   Human Resources for Health intervention development publication 2015

HUMAN RESOURCES FOR HEALTH

RESEARCH   **Open Access**

Using theory and formative research to design interventions to improve community health worker motivation, retention and performance in Mozambique and Uganda

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Abstract

Background: Community health workers (CHWs) are increasingly being used in low-income countries to address human resources shortages, yet there remain few effective, evidence-based strategies for addressing the enduring programmatic constraints of worker motivation, retention and performance. This paper describes how two interventions were designed by the Innovations at Scale for Community Access and Lasting Effects (inSCALE) project to address these constraints in Uganda and Mozambique drawing on behavioural theory and formative research results.

Methods: A review of the work motivation and CHW motivation literature—incorporating influences on retention and performance—was conducted on articles sourced through electronic web searches. Formative research with a focus on the barriers and facilitators to CHW motivation, retention and performance was conducted with community health workers and key stakeholders in Uganda and Mozambique. An analytical induction approach to the thematic analysis of transcripts from 98 in-depth interviews and 26 focus group discussions was adopted across the country settings.

Results: From the theoretical review, it was determined that the interventions should promote CHWs as members of a collective by highlighting a sense of shared experience, focus on alignment between worker and programme goals, and emphasise the actions that lead to good performance. The Social Identity Approach was selected as the theory most likely to lead to the development of effective, scalable and sustainable interventions by addressing the identified gap in the literature of the influence of CHW working context. The formative research indicated that CHWs value feedback and feeling connected to the health system and their community, are motivated by status and community standing, and want to be provided with the necessary tools to perform. Two interventions based on these results were developed: a participatory, local community approach and an information communication technology (ICT) approach.

Conclusions: Drawing on contextual data and theory that is sensitive to context can potentially lead to the development of appropriate and effective interventions when aiming to improve the motivation, retention and performance of CHWs in Uganda and Mozambique and other comparable settings. Evaluation of the developed interventions is crucial to assess this potential.

Keywords: Community health workers, Motivation, Retention, Performance, Social Identity Approach, Human resources for health, Uganda, Mozambique

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Background

Increasingly, community health workers (CHWs) are being utilised in low-income countries to perform key health tasks and address human resources shortages in line with the WHO's 'task shifting' agenda [1-8]. Despite this trend, the motivation, retention and performance of CHWs remain key reported constraints to the success of programmes in these settings [5,9]. While there is little available evidence relating to effective interventions to address these constraints [9-12], basing behavioural interventions on a theoretical understanding of behaviour, and empirical data from the behavioural context, has recently been emphasised when seeking to design successful public health programmes [4,9,13-15].

Previous enquiry focusing on the motivation, retention and performance of cadres of CHWs has typically sought to determine the right incentives to elicit tangible improvements in these outcomes [10,11,16-19]. In the few examples where theory has been drawn on to understand these outcomes, it has tended to focus on processes within the individual, with social and community factors largely providing contextual description [12,16,20]. Guidelines for managers of CHW programmes often recommend an approach that incorporates health system and community level factors [9,10,19]; however, psychological explanation of how such approaches may or may not lead to improved motivation, retention and performance remains dominated by behavioural theories that focus on the individual [13,21]. From a social psychological perspective, the importance of understanding the role of community context and culture, as well as individual cognitions, has been emphasised when seeking insight into the factors influencing CHW motivation, retention and performance [4,9].

The aim of this paper is to demonstrate how a behavioural theory, which accounts for the influence of group identification, in combination with data generated from qualitative interviews with CHWs and stakeholders, can be used to inform the design of interventions to improve CHW motivation, retention and performance in two settings—Uganda and Mozambique—with diverse, government-led CHW programmes. This work was conducted as part of the Innovations at Scale for Community Access and Lasting Effects (inSCALE) project [22,23], which is testing the impact of the interventions on the motivation, retention and performance of CHWs delivering Integrated Community Case Management (ICCM) of childhood diseases in Uganda and Mozambique. The inSCALE project will advocate for the incorporation of interventions found to be cost effective into the national CHW strategies of the respective countries.

Methods

Several methods were used to design the interventions including drawing on reviews of the implementation context, stakeholder consultations, theoretical reviews and formative research. A description of this process appears in Table 1, with more detailed accounts reported elsewhere [23,24]. This paper reports on two critical components of the process: the review of theory and the formative research.

Review of theory

We conducted reviews of theoretical literature relating to work motivation, retention and performance in general and to CHW motivation, retention and performance. Electronic internet searches on PubMed, Google and Google Scholar were performed using combinations of the following search terms: 'motivation', 'retention', 'performance', 'work', 'health worker', 'community health worker', 'CHW', 'community based agent' and 'CBA'. Relevant websites, such as www.chwcentral.org, were hand searched, as were the reference lists of included resources. Inclusion criteria were that studies be reported in the English language and, in the case of CHW motivation, published since 1990. Key CHW motivation resources were also identified through correspondence with authors who have published in the area.

We used this review to identify key theoretical dimensions to consider during intervention design and to select a focus theory. The selection of the focus theory to draw on was based on an assessment by the inSCALE study group of which was most likely to assist the development of effective interventions that would increase CHW motivation, retention and performance in the study context. Once the most suitable theory was selected, a second search was conducted using the terms 'social identity' and 'social identification'.

Formative research
Study setting

The study was conducted in Uganda's capital, Kampala, as well as in two districts (Kiboga and Hoima) in the country's mid-western region in January, February and May 2011 and in Massinga District and Inhambane Town in the central province of Inhambane, Mozambique, as well as in the capital city of Maputo in March 2012. The areas of operation were selected by the inSCALE project based on the ability to control for drug supply—a key additional programmatic constraint to health-focused CHW programmes—as these were provided by other projects. In both countries, the Ministries of Health utilise CHWs to deliver health promotion and ICCM of childhood diseases (namely malaria, pneumonia and diarrhoea). In keeping with the diverse nature of CHW programmes across country settings [25], there are however key programmatic differences between Uganda and Mozambique relating to CHW training, remuneration and support. In Uganda, CHWs are known as Village Health Team members

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Table 1 Process of identification and development of interventions

Step	Process
1	Identify interventions with the potential to improve the motivation, retention and performance of CHWs in Uganda and Mozambique by reviewing theoretical and empirical evidence, consulting with key stakeholders in the field and exploring the political and programmatic operating context
2	Conduct formative research with the key personnel targeted by and tasked with implementation of the proposed interventions to explore their feasibility and acceptability. Use the data generated to reduce the number of possible interventions
3	With the same personnel, explore the barriers and facilitators to CHW motivation, retention and performance and incorporate these lessons into intervention design
4	Design interventions to be implemented in Uganda and Mozambique and their implementation strategies drawing on theoretical and empirical evidence and the formative research data

(VHTs), operate as part of a five-member team and receive between 6 and 11 days training with between 25 and 90 CHWs per supervisor [26]. In Mozambique, CHWs are known as Agente Polivalente Elementares (APEs), work alone in their community and receive 4 months training with 2–3 CHWs per supervisor [27]. In Uganda, CHWs receive a travel allowance of US$ 4 per month and in Mozambique a subsidy of US$ 40 that represents approximately 60% of a minimum salary. While funding for the CHW programmes comes from external donors, in both countries, the role of NGOs has increasingly moved from implementation to technical support and quality assurance. The management and supply for all commodities and coordination of implementation is run by the respective national governments and district (Uganda) and provincial (Mozambique) authorities. The consistency of commodity supply is often however, as noted above, subject to donor assistance.

Sampling

In-depth interviews (IDIs) and focus group discussions (FGDs) were conducted with a range of target groups in Uganda and Mozambique. The respondent groups, methods and number and content of these research encounters are presented in Table 2. Sampling was purposive and for CHWs was based on stratification by relative proximity to supervising facility, use of mobile phones and network coverage as well as size of their community. Caregivers, mothers of children below 5 years and male heads of household were also stratified by size of community and proximity to a health facility. Supervisors were stratified by size of community and network coverage. Interview numbers were set in order to recruit multiple respondents in each stratum and maximise the likelihood of data saturation. Provision was made to recruit additional respondents in the event that data saturation was not reached, but this was not required.

Data collection and analysis

IDIs and FGDs ranging in duration from 45 to 120 min were conducted and digitally recorded in local languages and English by trained, multi-lingual fieldworkers using pre-tested discussion guides. Informed consent of participants was taken in compliance with the ethical approval conditions of the project[a] [28]. Audio recordings and fieldworker notes were used to produce *expanded notes* from what the respondent or respondents said with direct quotations used to illustrate the main points [29,30]. These were produced immediately following the research encounter and before the next interview or FGD to allow for more accurate capture of the content while it was fresh. Each set of expanded notes were discussed with fieldwork supervisors with the rapid implementation of any feedback.

Analytical induction, an iterative, inductive–deductive approach, was adopted as the analysis approach [31]. Interview and FGD topic guides were developed to explore barriers and facilitators of motivation, retention and performance as well as experiences and attitudes towards potential technology and community-based interventions. The original topic guides helped structure the thematic analysis, but scope remained for data to be generated in unanticipated content areas and for themes to emerge from the data [31]. *Expanded notes* from in-depth interviews and FGDs were analysed systematically for key themes using a content analysis approach [31-33].

Results

The summary of the results of the theoretical review is followed by the results of the formative research. Both sets of results informed the identification of key implications for intervention design. These implications are presented following the theory and formative research subsections. A description of the two inSCALE interventions appears at the end of the results section.

Theory

The results of the theoretical review relating to the broad area of *work motivation* (including its close relationship with retention and performance) are presented first before *CHW motivation* specifically and the selected theory—*the Social Identity Approach*.

Table 2 Respondent groups, methods and number and content of research encounters

Country	Method (number of encounters)	Respondents	Content
Uganda	IDIs (5), FGDs (3)	Ministry of Health personnel at national and district levels	Ranking of a long list of possible interventions and discussion of their acceptability and feasibility in context
Mozambique	IDIs (6), FGDs (4)	Ministry of Health personnel at national, district and provincial levels	
Uganda	IDIs (61)	CHWs (31), CHW supervisors (6), NGO and district personnel with experience in CHW programme implementation (6), local community leaders (6), caregivers of children below 5 years (6) and male heads of household (6)	CHW motivation and issues related to their retention, performance and interaction with their communityAcceptability and feasibility of possible interventions
Mozambique	IDIs (26)	CHWs (12), supervisors (6), community leaders (4), district- and province-level personnel with experience in CHW programme implementation (4)	
Uganda	FGDs (15)	CHWs (7), supervisors (3), district personnel with experience in CHW programme implementation (2), local community leaders (1), caregivers of children below 5 years (1) and male heads of household (1)	Acceptability and feasibility of possible interventions
Mozambique	FGDs (4)	Mothers of children below 5 years (4)	

Work motivation, retention and performance

The bulk of work motivation theory has been developed in high-income settings. In the early part of the twentieth century, enquiry into work motivation, and indeed retention and performance, typically rested on assumptions that behaviour was subject to a rational decision-making process occurring within the individual based on the pros and cons of a certain action or actions—i.e. 'rational' or 'economic choice' models [34-36]. Since the 1970s, from a social psychological perspective, Bandura's social cognitive theory has been one of the dominant theories applicable to work motivation [35,36]. Social cognition theory seeks to explain 'social behaviour with reference to individual mental processes' (Hepburn, 2003, P. 19) [37], with *self-efficacy, outcome expectancies* and *goal congruence* as important concepts [36,38]. It follows that providing a strong incentive to reach a work target or goal will only result in a worker mobilising extra effort to achieve it if they believe it is attainable through their endeavours (self-efficacy), it is worth pursuing in terms of expected outcomes (outcome expectancies) and the work goal aligns with their personal goals (goal congruence) [36].

A contrasting theory, put forward by Kanfer and Heggestad (1999), is that work motivation occurs as a function of the interaction between the person and the situation [39]. A key component of this interface has been proposed as the degree to which a worker's needs are satisfied—a factor commonly linked in the literature to the likelihood of their retention [10,11,18,35,36]. In the context of incentives, the power of a given incentive—such as a certain level of pay—to exact an increased level of performance from a worker has been seen as a function of both the degree to which the incentive is perceived to satisfy a worker's needs and how important the satisfaction of those needs is to the worker.

Needs satisfaction theories have typically driven the provision by employers of the appropriate work conditions and tools for role performance and maintenance (i.e. retention). Along with social cognition approaches, this strand of motivational theory has been particularly influential in the context of CHW motivation where the focus has predominantly been on finding the right match between incentives and the individual worker. This focus has seldom however been accompanied by scrutiny of the impact of social or contextual factors on the generation of these needs [10,17,21,40].

CHW motivation, retention and performance

Reviews of the motivation, retention and performance of CHWs in low-income settings have commonly focused on the provision of incentives [10,11,16-18]. They tend to emphasise the individual worker's cognitive response to their working, social and cultural context. Employment conditions and other contextual factors have, on occasions, been accounted for but usually in terms of how they are perceived by the individual. Thus, motivation has typically been viewed as an individual cognitive process where incentives influence or appeal to internal (e.g. values) and environmental (e.g. individual attitudes to contextual factors) components [12,16,20] with retention and performance occurring as a behavioural consequence of the level of motivation and job satisfaction (i.e. absence of dissatisfaction) [9-11]. This influence in combination with a general approach informed by the social cognition perspective has led to CHW work motivation being commonly defined as the 'individual's degree of willingness to exert and maintain an effort towards organizational goals' [12,16].

The model of health worker motivation developed by Kanfer and colleagues (2002 and 2004) is typical of approaches focusing on individual cognition [16,20]. It

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breaks down the determinants of health worker motivation into three layers—individual-level determinants, work context/organisational determinants and determinants resulting from broader society and culture. It assesses these layers from the standpoint of individual cognition in terms of what they mean for individual attitudes and behavioural intentions.

While offering key insights into the individual cognitive processes of motivation, models such as Franco's (2002 and 2004), and later Chandler's (2009), have been criticised for their overt focus on individual cognitions. For instance, Campbell and Scott (2011) argue that, when applied to CHWs, behavioural models that focus on individual cognition tend to underemphasise the impact of community influence on CHW programme outcomes [4]. Such accounts of CHW motivation suggest that understanding the influence of community context and culture beyond individual cognitions is critical when seeking insight into the constraints and facilitators of CHW motivation and the key to developing effective, context-specific strategies [4,9,10,21,41]. From this perspective, exploring the influence of community on the social norms and priority needs of CHWs becomes important when seeking to understand CHW motivation and how this leads to retention and performance [9,10,21].

Drawing on a theory that takes specific account of the social processes that inform needs prioritisation, and the value ascribed to incentives in context, would thus appear to be beneficial when seeking to develop effective interventions to motivate CHWs, satisfy them sufficiently that they remain in role, and perform in a manner aligned with the objectives of the CHW programme. Indeed, such an approach may both complement the more traditionally adopted social cognitive methods and provide a response to calls for greater focus on the influence of CHW working context.

The Social Identity Approach

The Social Identity Approach[b] (SIA) is a collection of behavioural theories that account for both individual cognition and contextual factors [34,42]. The SIA is psychological in that it offers insight into the processes within an individual that determine behaviour [42,43]. Critically, it is also social as it demonstrates how these processes are dependent upon interpersonal relationships and group memberships and their perceived value and significance to the individual [42,44].

According to the SIA, when a given group identity is relevant to an individual, and one *categorises* (i.e. identifies) oneself as a group member, one's behaviour becomes subject to perceived group social norms and what is seen to be in the group's interests [44,45]. Establishment of the group's 'positive distinctiveness' and status, standing and esteem become important drivers of the self-identifying

group member's behaviour [34,42,44,46-48]. In the context of work motivation, when workers define themselves more in terms of personal identity, it could be expected that individual motivators such as personal advancement or recognition may be more influential. When defining themselves in terms of social identity, motivators that impact on the groups one identifies with such as working conditions or status may be more influential [34]. The SIA is increasingly being applied in the context of work motivation—albeit more typically in high-income countries [34,43]—with this application yielding promising evidence for the link between identification and motivation [49-51].

It was determined by the inSCALE study group that the SIA provided a potentially valuable framework to guide the design of CHW interventions alongside key elements of the social cognition approach. We hypothesise that CHW motivation will increase as a function of the relevance of the CHW social identity to CHWs and the resulting identification of CHWs with that collective [34,48]. It is further proposed that work motivation is subject to the perception that the pursuit of the behaviours and activities required by the programme are in the collective's best interests [48]. Thus, if actions that promote the positive distinctiveness of the CHW collective are clearly communicated and understood, it is proposed that CHWs identifying with a shared social identity will be motivated to perform those actions [34,48]. Positive performance and retention is likely to follow to the degree that these are consistent with CHW perceptions of effective performance (i.e. it is worth it) and within the control of CHWs to influence and potentially achieve [34,48,49]. Assessing the cost-effectiveness of interventions developed based on the SIA will be a critical aspect when exploring the potential for implementation at scale in Uganda and Mozambique.

Key implications from the theoretical review for intervention design

From the results of the theoretical review, five key guiding principles for the intervention design were identified. These were that the interventions should:

1. Promote the correspondence between CHW goals and those of the programme.
2. Stimulate a feeling of shared experience and collective identity among CHWs.
3. Promote the value of achieving CHW programme goals to the CHW collective.
4. Clearly communicate the actions that lead to good and appropriate performance of CHW duties and promote the link between this performance and the distinctiveness of the CHW collective.
5. Focus on what is within the CHW's power to deliver.

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Formative research

The formative research results are presented in thematic areas that most directly influenced the development of the interventions, namely *motivation, retention, performance, community issues and influence,* and *challenges.*

Motivation

In Uganda, VHTs reported being motivated by helping fellow community members, not wishing to let them down and gaining their trust, respect and appreciation. They also found learning, meeting new people and receiving validation and feedback from their supervisors motivating.

> *When I began treating young people in the community by giving them drugs it has earned me respect in the community … this makes me feel motivated and feel good* (U VHT IDI 14)[c].

The benefit of having access to drugs to treat their own children was an added incentive.

In Mozambique, APEs reported being motivated by the responsibility of being chosen by their communities and the respect afforded them as someone perceived to be doing important work that contributes to a healthier community. They felt responsible for making best use of the training provided to them by virtue of being their community's representative to bring better health outcomes to the community.

> *I feel very well in doing my work because I have been chosen by the community members to help them, the people trust in me* (M APE IDI 12).

Retention

VHTs did not generally anticipate leaving their role though did on some occasions suggest that they would leave if they felt they had lost community trust and appreciation. They did commonly note however that events such as moving villages, falling ill or being voted out as the community representative could lead to them leaving as could being offered a paid role.

> *If I get a job where I am paid some money I would leave the VHT work because my family needs to survive and VHT work is voluntary* (M VHT IDI 9).

APEs and supervisors suggested that they would not leave their role and could not anticipate circumstances where this would be necessary. Commonly, a sense of duty and calling was cited as the reason.

> *As a Mozambican citizen I have to help the sick people … I will never stop working as an APE* (M APE IDI 11).

Performance

Discussions related to VHT performance centred on the amount of technical support provided, the need for health-related information and rapid feedback on submitted data. Such feedback, it was suggested, could come from the health facility-based supervisor or the community as represented by a committee.

> *I think it would be better in case there is a committee of people who can monitor the performance of these VHTs and also know their challenges and in case of any problems they can report to these people because as you know, people these days are not trusted, in case they are given medicine, they can decide to sell it so when there is a team monitoring these VHTs, they will fear to do so* (U Community Leader IDI 5).

> *Once I am told about how I perform it will motivate me to keep up the good performance or if I am performing below standard I will work hard to be a better performer* (U VHT IDI 31).

APEs commonly saw the value of supervision and support networks and identified the link between this and their performance on specific work tasks.

> *When I face a problem with my work I have sought the help of my supervisor because she is the person responsible for me and any problem that I might have and I cannot solve it alone she is the person who can help me* (M APE IDI 3).

For APEs, performance was heavily influenced by the availability of resources—especially drugs and transport means—as it impacted on the ability to treat patients. For VHTs, this challenge was felt to also impact on local credibility.

> *I've always reported to my supervisor about the problems of lack of money to pay for transportation for submitting data and collecting the medicines at the health facility but this concern has not yet solved* (M APE IDI 10).

> *I think the problems VHTs face are the drugs get out of stock and this interrupts the service they give* (U Male Head of Household IDI 2).

In Mozambique, while some supervisors felt APEs experienced challenges with their performance and emphasised the need for greater levels of technical supervision, others suggested that APEs had few problems. Supervisor perspective may however be influenced by their limited view of APE work due to the challenge of travelling to meet the APEs they supervise.

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My interaction with the APE depends on what we have to do. But it has not been regular as I would like... sometimes the APEs themselves call to me or I call them to ask for some specific information. For example, when we have a province visit from the APEs provincial programme staff, we take the opportunity to discuss issues related to our work (M Supervisor IDI 4).

Community issues and influence

In Uganda, the community and VHT response to proposed participatory activities with community members indicated that over time those that are invested in positive health outcomes in their community will maintain their efforts if content is fresh and locally meaningful and activities are purposeful and enjoyable. Community groups have reportedly met resistance in the past due to perceived agendas, exclusivity and inaction which have in turn led to apathy towards organised community meetings.

I normally notice a major problem of people losing trust and hope in these groups especially when their expectations are not met ... they end up demoralised as a result of no actions (U Caregiver to child below 5 years of age IDI 2).

Promoting the role of the VHT and the benefits they bring to community members as part of the solution to health challenges rather than emphasising health problems was suggested when seeking to maintain community participation and support of VHTs and increase VHT motivation.

If the VHT sees that the people s/he serves are concerned they will be more committed and love their work more (U Supervisor IDI 1).

I can easily explain to the members the challenges I experience and would also get their own views and ideas and together we can get a way forward..... it creates a level of understanding and togetherness (U VHT IDI 3).

In addition, VHTs saw the value of visible signifiers of their role as VHTs in generating community esteem.

Even having a VHT marked phone brings you respect from the people in your community (U VHT FGD 6).

In Mozambique, community members and APEs reported a good relationship between APEs and the community. APEs value the support/relationship and care how they are viewed by the community. The community use the APEs, think their work is important and respect them.

I feel very well in doing my work because I have been chosen by the community members to help them, the people trust in me and recognise that I have been doing a great work in community [sic] (M APE IDI 12).

As a result, while participatory activities in the community were not proposed in Mozambique, the intervention should highlight community support and use terminology that APEs find meaningful such as community reputation, respect and recognition.

Challenges

In Uganda, VHTs experienced some challenges with members of their local community based on what they saw as a misunderstanding of their role. They identified endorsement by supervisors as contributing to improved community credibility. VHTs also reported drug and essential equipment stock outs as well as challenges related to the distance from the health facility and their supervisors.

Community trust is increased by seeing our supervisor ... local authority interaction with VHTs would show they are valued (U VHT IDI 13).

As in Uganda, APEs in Mozambique on occasion faced the challenge of a lack of community understanding of the purpose and scope of their work. They felt that more frequent support and supervision for technical challenges was desirable and may aid their local credibility but identified the distance to their supervisors and the health facility as representing an obstacle to this occurring.

I have had contact with my supervisor because sometimes she has been visiting me here in the community to see how I'm taking care of sick children and to know what are my problems... but that was last year, this year she has not visited me yet (M APE IDI 9).

Key implications from the formative research for intervention design

From the results of the formative research, six key guiding principles for the intervention design were identified. These were:

1. CHWs are motivated by their status and standing in the community and a sense of the value they add.
2. CHWs value technical feedback and supportive encouragement from both supervisors and community members.
3. Feeling connected to both the health system and the community they serve motivates and validates CHWs in their role.

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4. Adequate resources—especially drugs—must be in place for CHWs to be motivated and perform.

5. Participatory activities in the community that are open to all, enjoyable, purposeful and focused on positive local health outcomes delivered through the CHWs are likely to sustain community interest and engagement and be motivating for CHWs (in Uganda).

6. Interventions supported by ICT that facilitate easy communication, provide context-specific technical support and engender a sense of connectedness to the health system, supervisors and peers are feasible and acceptable to CHWs in Uganda and Mozambique and likely to increase CHW motivation.

Interventions

Based on the key implications for intervention design drawn from the theoretical review and formative research, and following the development process outlined in Table 1, a 'community-supported intervention' was developed in Uganda and a 'technology-supported intervention' in Uganda and Mozambique. Drawing on social cognition approaches and the SIA specifically, as well as the results of the formative research, both interventions were designed to appeal to CHW goals through emphasising status and standing, promoting connectedness to the health system and the community, and providing technical feedback, encouragement and resources.

Based on the finding from the formative research that purposeful and participatory community activities that are open to all were likely to be motivating and sustainable for CHWs, the establishment of village health clubs [52] were decided upon as the key activity in what is called the 'community-supported intervention' in Uganda. Village health clubs will provide community access to technical and local health knowledge through CHW-facilitated meetings where attitudes to child health and the enabling role of the CHW can be positively influenced and realistic expectations promoted. The clubs will encourage CHW collaboration with and accountability to fellow community members in the shared enterprise of improved community health through the implementation of an action planning cycle. In doing so, it is proposed that community appreciation, understanding and respect for CHWs as well as a sense of community connectedness, all identified through the formative research as important to CHWs and their motivation, will increase. As a result, CHWs will, it is proposed, more readily identify themselves as a member of a CHW collective. See Table 3 for how the main findings from the theoretical review and formative research support the key elements of the community intervention.

The second intervention, known as the 'technology-supported intervention' will provide CHWs with mobile phones and solar chargers as both key tools for CHW work and signifiers of role that are likely to confer status

and standing as indicated by the formative research results. Linking to peers and supervisors through either calls or *short message service* (SMS) on the provided phones where the content of the communication is to be self-determined is a key component of the intervention that aims to promote opportunities for supportive encouragement as well a sense of connectedness to both the CHW community and the health system. Rapid, context-based feedback on submitted data is designed to both promote a sense of relevance of CHW work and validate each CHW's contribution to a health system of which they are a member. Regular SMS-based technical and motivational messages will address CHWs' identified need for technical feedback and support and represent an opportunity for the promotion of CHWs as key members of a valued and important collective. In addition, the supplied phones are programmed with software designed to directly influence role performance such as modified respiratory timers in Uganda and electronic job aids to support patient consultation in Mozambique. See Table 4 for how the main findings from the theoretical review and formative research support the key elements of the technology intervention.

While the interventions were designed based on a number of theories in addition to the SIA (notably outcome expectancies, goal congruence and an emphasis on self-efficacy from the social cognition theoretical tradition), the SIA is being explicitly described as a new and novel addition to the current theoretical literature relating to CHWs. As a result, both the community- and technology-supported interventions seek to promote positive CHW identity in a manner that resonates with the stated priorities of CHWs. The interventions are also designed to communicate the actions CHWs can take in carrying out their duties that will maintain this positive identity. It is proposed that CHWs will be more motivated to carry out these duties in intervention areas when compared against a control group.

Discussion

The inSCALE project utilised behavioural theory and the findings from formative research when developing two interventions to address the challenge of CHW motivation, retention and performance in Uganda and Mozambique. The findings of the theoretical review led to an emphasis during the intervention design process on the promotion of synergies between CHW goals and those of the CHW programme, the value of achieving those goals and building a sense of collective CHW identity. In addition, it was proposed that if the interventions could communicate desirable behaviours compatible with the CHW role as designed that were also perceived to improve the esteem in which CHWs were held, socially identified CHWs would be motivated to adopt these behaviours and performance benefits would follow.

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Table 3 Emphases from the theoretical review and formative research that support the key components of the community intervention

Community intervention		
Intervention	Way in which intervention will improve CHW motivation	
	Theory	Formative research—Uganda
Participatory village health club (VHC) facilitated by a CHW that is open to all, fun and focused on local health improvement *via* local community assets with emphasis on the CHW	• Reinforcement and validation of CHW role value to CHWs through facilitation of the VHC and receiving community feedback • By directly seeing and receiving feedback on impact of their work, CHWs will more readily recognise the value of their work to the community and CHW collective • Working directly with community members as they identify, prioritise and find solutions to local health challenges will reinforce a sense of connectedness between CHWs and their community • By operating in an interactive local forum, community expectations around what it is within the CHWs' power to deliver can be explained and managed	• CHWs want a greater sense of connectedness to their community. Community groups established to monitor and provide feedback to CHWs may improve motivation and performance by bringing CHWs closer to their community • Promoting the positive work that CHWs do in their community is reportedly motivating for CHWs and may engender greater community trust and standing/status of the CHWs • CHWs value community feedback • Locally meaningful activities are more likely to be sustained by the community with community groups highlighting the positive role played by CHWs, improving community esteem for CHWs

Formative research conducted with CHWs and stakeholders in CHW programmes also strongly influenced intervention design. The formative research findings led to a specific emphasis during the intervention design process on generating feedback from the health system and the community as well as cultivating a sense of connectedness with both. Promoting CHW status and standing was an additional emphasis. While broadly consistent with the recommendations of other studies of CHW motivation, the formative research revealed that these emphases were the most feasible and acceptable approaches in the context and were thus preferred to alternatives among a suite of strategies proposed elsewhere [9,10].

The inSCALE project is currently evaluating the effectiveness of the interventions. The perceptions of the main stakeholders (including CHWs) regarding the barriers to and facilitators of successful implementation will be explored qualitatively. Motivation, performance and retention as well as social identification of CHWs will also be assessed quantitatively through the development of appropriate questionnaires and the adoption of a cluster randomised control trial design. Drug supply and supervision will be controlled. Importantly, the different operating contexts CHWs face in Uganda and Mozambique will be accounted for when comparing results from the two sites and drawing conclusions regarding the utility of the theory and the effectiveness of the interventions when seeking to influence CHW motivation, performance and retention. The first aim of the evaluation is to provide insight into what influences these key constraints to the delivery of services utilising cadres of CHWs. As a second aim, the data generated will allow for an analysis of the suitability of the SIA as a behavioural theory to guide

intervention development in these settings. A third aim is to contribute to the evidence base for the effectiveness of interventions targeting CHW motivation that is currently small in the case of both community participatory and technology-supported interventions.

For the purpose of assessing the SIA for suitability when designing CHW motivation interventions, a model developed by van Knippenberg (2000) [48] will be drawn upon (Figure 1). When applying the model to CHWs it proposes that CHW satisfaction with their role and motivation to exert effort on behalf of the CHW programme is a function of the salience or relevance of the CHW social identity to CHWs and resulting identification with that collective. It further proposes that work motivation is subject to the perception that the performance of the work-based behaviour required by the programme is in the collective's (i.e. CHW's) best interests. Thus, if the actions that promote the positive distinctiveness of the CHW collective are made clear by the programme environment (i.e. current CHW programme plus the inSCALE interventions in the current study), CHWs identifying with a shared social identity will, it is proposed, be motivated to perform those tasks.

The SIA was deemed by the inSCALE study group to represent an innovative approach to the enduring challenge of CHW motivation, retention and performance. There are however many behavioural theories, and a case could be made for the adoption of alternatives to the SIA. The SIA was selected primarily in response to the call for greater emphasis and sensitivity to the context of CHW work [4] which ruled out a focus on, for instance, personality—an influential line of work motivation enquiry in the twentieth century not explored in this paper [35]. The selection of the SIA was made by an

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Table 4 Emphases from the theoretical review and formative research that support the key components of the technology intervention

Technology intervention			
Intervention component	**Way in which intervention will improve CHW motivation**		
	Theory	**Formative research**	
		Uganda	**Mozambique**
Closed user groups	Potentially stimulate a feeling of shared experience and collective identity among CHWs.	Considered feasible and acceptable by Ministry of Health personnel	
		Phone as a signifier of role—may increase the status and standing of CHWs in their community	
		Increase ease of communication with supervisors and promote a sense of connectedness to health system	
	Specifically, by promoting interaction with peers and supervisors, CHWs may: • Gain a greater sense of the correspondence between CHW goals and those of the programme • Understand the value of achieving programme goals to the community and CHW collective • Understand and normalise positive, appropriate and distinguishing actions of 'good' CHWs	Aid prompt CHW reporting of stock outs and other challenges	
		No need for CHWs to use own phone—cost saving plus potential to earn from solar charger	
		CHWs already meet informally so formalises an existing structure that is valued	
		Need for guidance on who initiates calls as CHWs can find unscheduled calls stressful	Concerns around supervisor workload led to recommendation that supervisors be available for contact at certain times only potentially leading to the provision of more efficient and targeted feedback through managing supervisor workload
CHW electronic data submission and feedback and targeted supervision	Through targeted feedback delivered by supervisors: • Gain a greater sense of the correspondence between own goals and those of the programme • Understand and normalise positive, appropriate and distinguishing actions of good CHWs • Promote realistic actions of CHWs that are within their power to deliver	Feeling valued and linked to the health system	
		Feeling encouraged by positive local gains/improved community health and their role	
		Strong desire among CHWs for feedback and more supervision—targeted supervision welcome	
		Concerns about supervisor speed of responsiveness—needs to be sufficiently prompt to avoid CHW discouragement	Tone of messages key with need for polite and respectful language emphasised in order to be motivating with no admonishments for poor performance
Monthly motivational SMS	Through contextually appropriate and regular messages: • Promote the correspondence between CHW goals and those of the programme • Promote the shared experience of CHWs • Promote the value of achieving programme goals to the CHW collective • Validate and normalise positive, appropriate and distinguishing actions of 'good' CHWs • Promote realistic actions of CHWs that are within their power to deliver	Positive, encouraging, polite and respectful tone with emphasis on the value CHWs bring to their community	
		Important to feel valued, supported and linked to the health system	
		Receiving messages that are locally relevant and address key challenges promotes a sense of CHW relevance and importance to the health system	
		If the message resonates with data submitted, then will be perceived as performance-related feedback which was considered motivating by CHWs	

experienced multi-country team tasked with being innovative and was based on several reviews and consultations [9,23].

The inSCALE study group determined that if a link can be established between CHW motivation and the identification of individual CHWs with a collective CHW identity, then there may be a rationale for the development of simple, collective identity-focused interventions when seeking to influence CHW motivation at scale. Indeed, a focus on the development of interventions that appeal to the needs of CHW collectives in different contexts, and thus galvanise them *en masse* to perform the actions they perceive to be in the interests of the group with which they identify, may offer a cost-effective complement to the traditional strategy of creating an incentive package [10,11,16-19].

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Figure 1 A social identity model of work motivation and performance (van Knippenberg, 2000) [48]. © International Association for Applied Psychology, 2000[d].
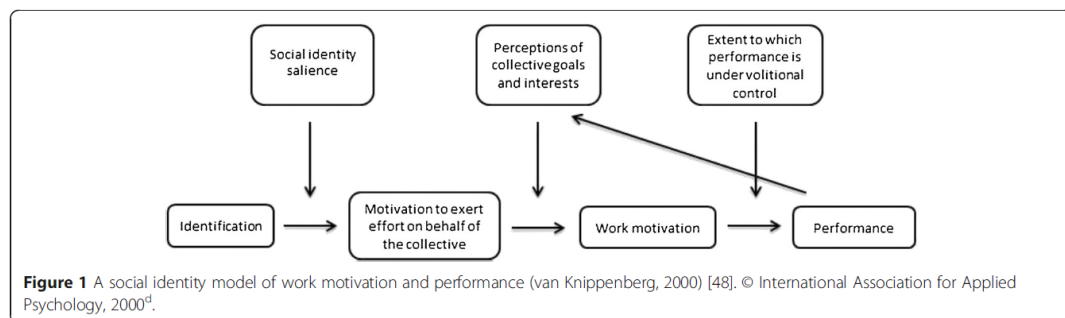
Conclusion

It is proposed in this paper that drawing on contextual data and theory that is sensitive to context will lead to the development of more appropriate and effective interventions when aiming to improve the motivation, retention and performance of CHWs in Uganda and Mozambique. Evaluation of the interventions developed by the inSCALE project and described in this paper will allow for an assessment of the suitability of the SIA for guiding intervention development for this purpose. In addition, it will inform the assessment of whether taking interventions designed drawing on its key tenets to national scale in Uganda and Mozambique is warranted. Should this prove to be the case, an increased focus on appealing to the needs of socially identified collectives of CHWs may represent a relatively simple, cost-effective and complementary strategy to the traditional approach of tailored incentive packages.

Endnotes

[a]Written consent was obtained from all research participants before interview. The trial protocol was approved by Makerere University Institutional Review Board in Uganda, the Uganda National Council of Science and Technology (ref. HS 958), the Comité Nacional de Bioética para a Saúde in Mozambique (ref. 331/CNBS/12) and London School of Hygiene & Tropical Medicine Ethics Committee in the UK (ref. 5762). The study has been registered as a randomised controlled trial with http://www.clinicaltrials.gov (identifier NCT01972321).

[b]The Social Identity Approach was a term coined to describe social identity theory and social categorisation theory and the bank of empirical work and evidence-based practices that have been developed through the 30 or so years of the approach's development [34].

[c]NB: The results are presented with direct illustrative quotes from respondents. They are followed by abbreviations to indicate from which country and group they originated (U = Uganda, M = Mozambique, VHT = Village Health Team member in Uganda, APE = Agente Polivalente Elementar in Mozambique, supervisor, male head of household, caregiver for child below 5 years of age, community leader) and the number of the IDI or FGD.

[d]© International Association for Applied Psychology, 2000. Published by Blackwell Publishers, 108 Cowley Road, Oxford OX4 1JF, UK and 350 Main Street, Malden, MA 02148, USA.

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Designing interventions to improve community health worker motivation, retention and performance in Uganda and Mozambique

Daniel Llywelyn Strachan[1]*, Karin Källander[2,3], Maureen Nakirunda[4], Sozinho Ndima[5], Abel Muiambo[5], Zelee Hill[1] and the inSCALE study group

9.6 Topic guides for VHT formative research interviews

inSCALE

Innovations at Scale for Community Access and Lasting Effects

inSCALE VHT in-depth interview guide: iCCM VHTs

Date of interview:_____

Time interview started: _____

Time interview finished:_____

Fieldworker number: _____

VHT research number: _____

VHT 'strata' (i.e. Kiboga or Hoima, urban or rural, basic training or iCCM training, electronic data submission or paper based, good phone coverage or poor coverage**):**

_____

Demographic information

1. Community (include geography, cell phone access, data submission methods and type of supervising facility):

2. Number and type of VHTs in community:

3. Name of supervising facility:

4. Distance to supervising facility:

5. VHT number (VHT nominated):

6. Age:

7. Regular occupation:

8. Ethnicity / tribe:

9. Marital status:

10. Literacy (ability to read and write in any language):

11. Education:

12. Socio economic status (observe):

13. Length of time living in community:

14. When trained as a VHT (basic training):

15. When trained as a VHT (iCCM):

16. Comments:

1

Theme 1: Current experiences, successes and challenges with skills, supervision and motivation

Say: *I would now like to talk to you about your current experiences as a VHT member. In particular I would like to ask about the successes and challenges you have experienced developing and using your skills, the supervision you have had and your motivation to perform.*

1.1 What are your duties as a VHT?
   a. What activities do you do as a VHT? **Probe:** Treating children, counseling.
   b. On average how many days a week do you do VHT work?
   c. On the days you do VHT work how much time do you spend on the work?
   d. Is this more or less time than you would like to spend? Why?
   e. What motivates you to do this work? What would make you decide to stop doing this work?

1.2 Do you have many problems with your work? What are they? If you have a problem with your work who would you go to? How often? Why that person?

1.3 Does anyone check what you do or give you advice about your VHT work? **If yes**
   a. Who are they? What do they do? How often are you in contact with them?
   b. Would you like more or less of these checks or advice?
   c. Name one thing you like and one thing you dislike about the checks/advice?
   d. How could these checks or advice be made more useful?

1.4 Do you have any other contacts (whether in person or through technology, initiated by the VHT or by another person) with people from the health facility or in the community related to your work as a VHT? **Probe:** Contacts located at the facility, contacts located in the community, contact through phones and texts.
   a. What happens in these contacts? Who are they with? How often do they occur?
   b. Would you like more or less contacts? Why/why not?
   c. Name one thing you like and one thing you dislike about these contacts?
   d. How could these contacts be made more useful?

1.5 Do you submit any information to the facility? **If yes**
   a. Who to? How often?
   b. What happens to the data?
   c. Name one thing you like and one thing you dislike about submitting data?
   d. How could submitting data be made more useful?

1.6 What information do you receive about how your work and how the program is going?
   a. Who from? How? How often?

2

b. Is this information important to you? Why/Why not?

c. What information would you like to receive about your work and how the VHT program as a whole is going? How do you think this information would affect your work?

1.7 Can you explain how the different VHTs in your community work? **Probe:** How do they divide their work? Is the supervision the same? Do they receive different items or remunerations? Are all VHTs respected and supported in the community in the same way? **If any differences reported ask**: How do the VHTs feel about these differences?

1.8 Do you interact with other VHTs? **If yes**
   a. Where? About what? How often?
   b. Name one thing you like and one thing you dislike about these interactions?
   c. How could these interactions be made more useful?
   d. Do you feel part of a team? If yes, is this positive? Why? If no, why do you think this is? Is it important?

1.9 Please arrange the following activities starting with the activity you do best?
   - Mobilise the community for improved health
   - Promote health to prevent disease
   - Treat a child less than 5 years old who has a cough, diarrhea and / or fever
   - Refer children under 5 with danger signs.
   - Conduct home visits to assess newborns and refer those with danger signs
   - Complete the VHT register

   a. Why did you put them in that order?
   b. What are the greatest challenges you have doing each activity?

Theme 2: Current experiences and use of phones

Say: *I would now like to talk to you about your experiences with and opinion of mobile phones. Specifically I would like to talk to you about the use of mobile phones in your tasks as a VHT.*

2.1 We are thinking of trying out different ways mobile phones can be used in the VHT program

    a. Do you currently have a phone (any phone – for personal and / or VHT use)?

If yes or did have up until recently, ask?

    b. What do you use it / them for?

    c. How often is / are your phone/s turned on?

    d. Is the phone / are the phones always with you?

    e. How do you charge it / them? Is it / are they ever out of battery for more than 2 days?

    f. **If respondent only has a personal phone ask:** Do you ever use your phone/s for VHT activities?

    g. Do you use any of the following features: sending SMS, receiving SMS, using the address book? What other features do you use?

    h. What operator/s do you use (e.g. MTN, Orange, UTL etc)? Why?

    i. What language do you text in? Why? How long are the texts you usually send or receive?

    j. What do you do if your phone/s needs repairing?

    k. Where do you get airtime from?

    l. What do you like and dislike most about your phone/s?

    m. Do you have any problems with the phone/s or with using it?

    n. What features is it best for a phone to have? **Probe: size, shape, color, length of time stays charged, other**

4

inSCALE

Innovations at Scale for Community Access and Lasting Effects

VHT in-depth interview guide: iCCM VHTs

Date of interview:_____

Time interview started: _____

Time interview finished:_____

Fieldworker number: _____

VHT research number: _____

VHT 'strata'(i.e. Kiboga, medium or large communities supervised**):** _____

Demographic information

1. Community operate in (include geography, accessibility and other key features):

2. Number and type of VHTs in community:

3. Name of supervising facility:

4. Distance to supervising facility:

5. Age:

6. Regular occupation:

7. Ethnicity / tribe:

8. Marital status:

9. Literacy (ability to read and write in any language):

10. Education:

11. Length of time living in community:

12. When trained as a VHT (iCCM):

13. Comments:

1

Theme 1: views on village committees

Say: *We are thinking of helping communities select a group of people from their community who would meet every three months to support VHTs in their work. We are calling this group the village committee. This village committee will support VHTs in their work by:*
- *Raising awareness in the community of VHT work,*
- *Working with VHTs to review their records and understand their challenges,*
- *Solving VHT problems at the community level and communicating with supervisors about broader problems,*
- *Arranging village meetings to discuss VHT work and to develop plans to solve VHT problems*

Supervisors would continue with their normal supervision, would attend the village meetings and would need to be ready to help solve the problems that cannot be solved at community level.

1.1   Do any groups like this already exist in the community? If yes what do they do?

1.2   Based on your work and your knowledge of the community do you think the work of this village committee would improve your work as a VHT? Why/Why not? **If yes:** How do you think the village committees would improve your work as a VHTs?

1.3   Are there any particular components of that you think would be beneficial or not beneficial to VHT work? Why/Why not? (**Remind the respondent of each component).**

1.4   Are there any components that you think would be challenging to set up?
       If yes: Why? What could improve the chance that they are set up successfully?

1.5   Are there any components that you think would be difficult to keep going over time?
       If yes: Why? What could improve the chance that they keep going over time?
       Probe:
       - Would people attend the **committee meetings**? Why/why not?
       - Would people attend the **village meetings**? Why / why not?
       - Would people be able to discuss, make plans and solve VHT problems through the **committee**? Why/Why not?
       - Would people be able to discuss, make plans and solve VHT problems through the **village meetings**? Why/Why not?

1.6   Are there any components that could be added to help support and improve VHT work?
       (Probe for details of any suggested additional components)

1.7   How do you think the members of the village committee should be selected? Are there any people who definitely need to be in the group or who should definitely not be in the group? Why?

1.8   How do you think the community meeting could best be organized?
       - Should the meeting be attended by everyone or only by some members of the community? Why?
       - How could we ensure that the meeting is not dominated by a few people?

1.9   What about the committee how could that best be organized?

1.10   How do you think this idea would affect your work with the community and your supervisor?

2

- How could you best be involved in the committee and the village meetings?
- What would be the benefits and the problems of you attending the committee and village meetings?
- Do you think such a committee could improve the support and supervision provided to you and other VHTs? **If yes, ask**: how? **If no, ask**: why not?
  (**NB**: allow respondent to answer the question. When they have finished talking **probe**: support and supervision from the community and support and supervision from the health facility based supervisor)

1.11 If the committee approached your supervisor with problems that the health facility needed to address to ensure you could work better:
- What would be the best way for the committee to interact with your supervisor about these problems?
- How do you think your supervisor would react?
- What do you think would happen if the problem was hard to solve like drug stock outs?

Theme 2: Views on collecting, collating and presenting data to the community

Say: *We think one of the best ways for the committee and the community to understand the work of VHTs is for them to review VHT records. We would now like to talk to you about the information that you think would be most useful for the committee and the community to review.*

2.1 What sort of information would be most useful for the committee and the community to have in order to understand your work and the problems and successes you and other VHTs have?

2.2 Where should the data come from? **Probe for the advantages and disadvantages of each of the following:**
- You (the VHT) summarise the data yourselves every three months?
- The parish supervisor summarizes the data and sends it to the village committee?
- Your supervisor or someone from the health facility summarizes the data?

2.3 How could this data best be presented? (**probe:** verbal information explaining the data, visual representation of data such as charts and graphs, other ideas**)**

2.4 Who should present this information to the committee and the community? (**Probe:** VHTs, supervisors, others?)

3

9.7   Details of VHTs sampled for VHT 'cognitive interviews' for measurement scale validation (Chapters 4 & 5)

Table 9.2: District, workload, supervision, sex, age and interview guide allocation of 24 sampled VHTs for cognitive interviews

Interview respondent	District Hoima = 1 Kiboga = 2 Kiryandongo = 3	Workload	Supervision	Sex Female = F Male = M	Age	Interview Guide 1A 1B
		High = H, Low = L				
1	3	H	H	F	48	1A
2	3	H	H	M	20	1B
3	3	L	H	F	48	1B
4	3	H	L	M	37	1A
5	1	L	H	M	46	1B
6	1	L	H	F	44	1B
7	1	H	H	F	31	1A
8	1	L	H	F	40	1A
9	1	L	L	F	39	1A
10	1	L	H	M	15	1B
11	1	L	H	F	47	1B
12	1	L	H	M	28	1A
13	1	L	H	M	29	1A
14	1	L	L	F	25	1B
15	1	H	L	M	22	1A
16	1	H	L	F	46	1A
17	1	H	L	M	26	1A
18	1	H	H	M	25	1B
19	2	L	L	F	48	1B
20	2	L	L	F	47	1A
21	2	L	H	M	23	1B
22	2	L	H	F	26	1B
23	2	H	H	F	33	1B
24	2	L	H	M	38	1A

9.8   Topic guides for VHT 'cognitive interviews'

VHT survey validation interview topic guide: version 1A [post pre-test]   Feb, 2013

NB: three aids are to accompany this guide. They are:

1. Item meaning description for fieldworker reference
2. Response category visual aid (i.e. five pictures of woman with facial expression for each response category)
3. Glossary of key terms used in local language (**to be used only if VHT does not understand English**)

Background information

Fieldworker ID:
Interview guide used:
Respondent name:
Respondent level of education reached:
When respondent first became a VHT:
When respondent received training in iCCM:
Time interview took:

Part A: question structure

[Say:]

I would like to read you some statements about your work as a VHT. The statements will sound like it is you saying them. Please think about each statement and tell me whether you strongly agree, agree, feel neutral, disagree or strongly disagree. After you have answered I will ask you some questions about how you understood the statement.

(Show pictures) Pictures are provided to help you understand the different ways of responding to each statement *(read out the response categories and indicate the associated image one by one).*

| Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
| 1 | 2 | 3 | 4 | 5 |

[Say:]

The following is an example so you understand how the questions work

Example statement:

1

Today I feel good		Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
		1	2	3	4	5
1	Is what you need to do to answer the question clear to you? *Clarify any confusion about the question structure and response categories*					
2	Do you think the pictures help when thinking of how to answer? Why / why not? *While showing each picture one by one ask:* does the image match the word in meaning for you? Why / why not?					
3	Do the response options make sense? Would you feel comfortable responding with each of these responses if this represented how you feel? Why / why not?					

Part B: motivation item wording

NB: For the questions in section B it is not important that the respondent provides a response to the statement in terms of whether they 'strongly agree', 'agree' etc. The focus is on them defining the statement in their own words	
Statements:	

1	Overall, I am satisfied with my role as a VHT	Strongly Agree 1 Agree 2 Neutral 3 Disagree 4 Strongly Disagree 5
1.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	
1.2	When you say you are 'satisfied' what does this mean?	
1.3	If I ask you about 'your role as a VHT' what do you think I am asking about?	

2	I think the work I am asked to do is worthwhile	Strongly Agree 1 Agree 2 Neutral 3 Disagree 4 Strongly Disagree 5
2.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	
2.2	If you say something is 'worthwhile' what does that mean?	

2

3	The work I do as a VHT provides me with what I need	Strongly Agree 1 Agree 2 Neutral 3 Disagree 4 Strongly Disagree 5
3.1	*Say:* Please tell me what this statement means in your own words? **If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:** how could this statement be worded differently to make the meaning clearer? **Probe for terms that are unclear and whether there are other words that would be better to use**	
3.2	What 'needs' is this statement referring to?	
4	It is important that I do a good job as a VHT so that the VHT program works well	Strongly Agree 1 Agree 2 Neutral 3 Disagree 4 Strongly Disagree 5
4.1	*Say:* Please tell me what this statement means in your own words? **If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:** how could this statement be worded differently to make the meaning clearer? **Probe for terms that are unclear and whether there are other words that would be better to use**	
4.2	What is the 'VHT program'?	
5	I am respected in my community for the work I do as a VHT	Strongly Agree 1 Agree 2 Neutral 3 Disagree 4 Strongly Disagree 5
5.1	*Say:* Please tell me what this statement means in your own words? **If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:** how could this statement be worded differently to make the meaning clearer? **Probe for terms that are unclear and whether there are other words that would be better to use**	
5.2	How would you know if you are respected in the community for your work as a VHT?	
5.3	What comes to your mind when you think of your 'community'?	
6	At the moment I don't feel motivated to work as hard as I can	Strongly Agree Neutral Disagree Strongly

			Agree				Disagree
			1	2	3	4	5
6.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*						
6.2	What does 'at the moment' mean?						
6.3	If you are 'motivated' to do something what does this mean?						

<table>
<tr><td>7</td><td>I only do this job for the benefits that come with it</td><td colspan="5">Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree
1   2   3   4   5</td></tr>
</table>

7.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*
7.2	When I ask you about 'benefits' related to the work you do what do you think of? *Probe 'financial' and non-financial' benefits*
7.4	What would other VHTs think of when responding to this statement?

<table>
<tr><td>8</td><td>I feel motivated to perform the tasks required of me as a VHT</td><td colspan="5">Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree
1   2   3   4   5</td></tr>
</table>

8.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*
8.2	What does 'performing required tasks' mean?

<table>
<tr><td>9</td><td>I am proud to be working as a VHT</td><td colspan="5">Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree
1   2   3   4   5</td></tr>
</table>

4

9.1	*Say:* Please tell me what this statement means in your own words?
	If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask: how could this statement be worded differently to make the meaning clearer?*
	Probe for terms that are unclear and whether there are other words that would be better to use
9.2	When you say you are 'proud' of something, what does this mean?

10	I feel committed to my VHT role	Strongly Agree 1 Agree 2 Neutral 3 Disagree 4 Strongly Disagree 5
10.1	*Say:* Please tell me what this statement means in your own words?	
	If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask: how could this statement be worded differently to make the meaning clearer?*	
	Probe for terms that are unclear and whether there are other words that would be better to use	
10.2	What is 'commitment'? What is an example of 'commitment'?	

11	What the VHT program wants to achieve and what I want to achieve are the same	Strongly Agree 1 Agree 2 Neutral 3 Disagree 4 Strongly Disagree 5
11.1	*Say:* Please tell me what this statement means in your own words?	
	If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask: how could this statement be worded differently to make the meaning clearer?*	
	Probe for terms that are unclear and whether there are other words that would be better to use	

12	I intend to stop working as a VHT	Strongly Agree 1 Agree 2 Neutral 3 Disagree 4 Strongly Disagree 5
12.1	*Say:* Please tell me what this statement means in your own words?	
	If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask: how could this statement be worded differently to make the meaning clearer?*	
	Probe for terms that are unclear and whether there are other words that would be better to use	
12.2	If you say you 'intend' to do something, what does this mean?	

5

NB	Questions 13 – 23 appear in interview guide B instead of questions 1 - 12

24	Would any of these statements be difficult for VHTs to respond to? Why? Could any of them cause offense? Why?

NB: Only ask questions 25 and 26 if the respondent nominated an answer to the statements (i.e. 'strongly agree' etc) and used the pictures to do so

25	Do you think the pictures help when thinking of how to answer? Why / why not?
26	Do the response options make sense? Would you feel comfortable responding with each of these responses if this represented how you feel? Why / why not?

Part 3: VHT identity

[Say:]

I would now like to ask you some questions about your role as a VHT and the different types of VHT

3.1	Are there different types of VHTs? **If no, skip to question 3.2** **If yes, ask**: what are they? What are the terms used to describe them? Are the differences between the different types of VHT clear? Why / why not?
3.2	What term would you use to refer to yourself in your community?
3.3	How would you refer to yourself to sound different to VHTs with basic training (i.e. without additional training in iCCM)?
3.4	How would you refer to your community's VHT to sound different to other community's VHTs?
3.5	What term would you use to describe all VHTs?
NB: If it has not been explored through the previous questions please make sure to probe the best way to refer to: - *VHTs?* - *iCCM trained VHTs?* - *local VHT members?* *If not already explored please also probe alternative wording for these three types of VHT as well as any other type referred to above*	

*NB: For questions27-32 it is **not** important that the respondent provides a response to the statement in terms of whether they 'strongly agree', 'agree' etc. The focus is on them defining the statement in their own words*
Statements:

6

27	I identify with VHT[s]	Strongly Agree 1 — Agree 2 — Neutral 3 — Disagree 4 — Strongly Disagree 5
27.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	
27.2	What does 'identify' mean?	
27.3	When we ask about VHTs, who does this refer to?	
28	I feel committed to the VHT program	Strongly Agree 1 — Agree 2 — Neutral 3 — Disagree 4 — Strongly Disagree 5
28.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	
28.2	What does 'committed' mean?	
29	I am glad to be a VHT	Strongly Agree 1 — Agree 2 — Neutral 3 — Disagree 4 — Strongly Disagree 5
29.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	
29.2	What does 'glad' mean?	
30	Being a VHT is an important part of how I see myself	Strongly Agree — Neutral Disagree Strongly

7

		Agree				Disagree
		1	2	3	4	5
30.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*					
30.2	If I ask 'how do you see yourself' what do you think? Does this question make sense?					

31	I identify with iCCM trained VHTs	Strongly Agree 1	Agree 2	Neutral 3	Disagree 4	Strongly Disagree 5
31.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*					

32	I identify with my local VHT	Strongly Agree 1	Agree 2	Neutral 3	Disagree 4	Strongly Disagree 5
32.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*					

Part 4: Language

[Say:]

Today and in the past we aimed to interview you in English with the assistance of local language translations for some key words. The language/s we used today was/were (**add name of language/s used**).

[Ask:]

4.1	How well today and in the past have you understood questions in English? *If relevant, ask:* What helps your understanding?
4.2	Apart from the languages used today which other languages could you be interviewed in?

8

VHT survey validation interview topic guide: version 1B [post pre-test]   Feb, 2013

NB: three aids are to accompany this guide. They are:

1. Item meaning description for fieldworker reference
2. Response category visual aid (i.e. five pictures of woman with facial expression for each response category)
3. Glossary of key terms used in local language (**to be used only if VHT does not understand English**)

Background information

Fieldworker ID:

Interview guide used:

Respondent name:

Respondent level of education reached:

When respondent first became a VHT:

When respondent received training in iCCM:

Time interview took:

Part 1: question structure

[Say:]

I would like to read you some statements about your work as a VHT. The statements will sound like it is you saying them. Please think about each statement and tell me whether you strongly agree, agree, feel neutral, disagree or strongly disagree. After you have answered I will ask you some questions about how you understood the statement.

(Show pictures) Pictures are provided to help you understand the different ways of responding to each statement *(read out the response categories and indicate the associated image one by one).*

| Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
| 1 | 2 | 3 | 4 | 5 |

[Say:]

The following is an example so you understand how the questions work

Example statement:

1

Today I feel good	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
	1	2	3	4	5

1.1	Is what you need to do to answer the question clear to you? *Clarify any confusion about the question structure and response categories*
2.1	Do you think the pictures help when thinking of how to answer? Why / why not? *While showing each picture one by one ask:* does the image match the word in meaning for you? Why / why not?
3.1	Do the response options make sense? Would you feel comfortable responding with each of these responses if this represented how you feel? Why / why not?

Part 2: motivation item wording

NB: For the questions in section B it is not important that the respondent provides a response to the statement in terms of whether they 'strongly agree', 'agree' etc. The focus is on them defining the statement in their own words

Statements:

13	I expect to stay working as a VHT in the future	

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		1	2	3	4	5

13.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*
13.2	If you 'expect' to do something, what does this mean?

14	I can't complete all of the work I am expected to do	

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		1	2	3	4	5

14.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*

15	I am willing to do more than is asked of me as a VHT	

2

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		1	2	3	4	5

15.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	

16	Sometimes what I am asked to do as a VHT doesn't make sense but I do it anyway.	Strongly Agree **1** Agree **2** Neutral **3** Disagree **4** Strongly Disagree **5**
16.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	
16.2	If something 'doesn't make sense' what does this mean?	

17	The VHTs who are best at their job are the ones who get the most benefits	Strongly Agree **1** Agree **2** Neutral **3** Disagree **4** Strongly Disagree **5**
17.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	
17.2	When I ask you about 'benefits' related to the work you do what do you think of? *Probe 'financial' and non-financial' benefits*	

18	The VHT program provides everything I need to do my job properly	Strongly Agree **1** Agree **2** Neutral **3** Disagree **4** Strongly Disagree **5**
18.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement	

3

	be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	

19	Suggestions made by VHTs on how to improve their work are usually ignored by supervisors	Strongly Agree 1 Agree 2 Neutral 3 Disagree 4 Strongly Disagree 5
19.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	
20	The supervision of my work is good	Strongly Agree 1 Agree 2 Neutral 3 Disagree 4 Strongly Disagree 5
20.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	
21	If I do well as a VHT I will achieve my goals	Strongly Agree 1 Agree 2 Neutral 3 Disagree 4 Strongly Disagree 5
21.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	
21.2	What are goals? Do you have goals? Can you give me an example	
22	It is easy for me to keep going to get what I want	Strongly Agree Agree Neutral Disagree Strongly Disagree

		1	2	3	4	5
22.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*					

23	I can solve most problems I face as a VHT if I put in the necessary effort	 Strongly Agree Agree Neutral Disagree Strongly Disagree 1 2 3 4 5
23.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	

24	Would any of these statements be difficult for VHTs to respond to? Why? Could any of them cause offense? Why?
NB: Only ask questions 25 and 26 if the respondent nominated an answer to the statements (i.e. 'strongly agree' etc) and used the pictures to do so	
25	Do you think the pictures help when thinking of how to answer? Why / why not?
26	Do the response options make sense? Would you feel comfortable responding with each of these responses if this represented how you feel? Why / why not?

Part 3: VHT identity

[Say:]

I would now like to ask you some questions about your role as a VHT and the different types of VHT

3.1	Are there different types of VHTs? *If no, skip to question 3.2* *If yes, ask*: what are they? What are the terms used to describe them? Are the differences between the different types of VHT clear? Why / why not?
3.2	What term would you use to refer to yourself in your community?
3.3	How would you refer to yourself to sound different to VHTs with basic training (i.e. without additional training in iCCM)?
3.4	How would you refer to your community's VHT to sound different to other community's VHTs?

5

3.5	What term would you use to describe all VHTs?

NB: If it has not been explored through the previous questions please make sure to probe the best way to refer to:

- *VHTs?*
- *iCCM trained VHTs?*
- *local VHT members?*

If not already explored please also probe alternative wording for these three types of VHT as well as any other type referred to above

NB: For questions27-32 it is not important that the respondent provides a response to the statement in terms of whether they 'strongly agree', 'agree' etc. The focus is on them defining the statement in their own words

Statements:

27	I identify with VHT[s]	
		Strongly Agree **1** Agree **2** Neutral **3** Disagree **4** Strongly Disagree **5**
27.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	
27.2	What does 'identify' mean?	
27.3	When we ask about VHTs, who does this refer to?	

28	I feel committed to the VHT program	
		Strongly Agree **1** Agree **2** Neutral **3** Disagree **4** Strongly Disagree **5**
28.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	
28.2	What does 'committed' mean?	

6

29	I am glad to be a VHT	Strongly Agree / Agree / Neutral / Disagree / Strongly Disagree
		Strongly Agree — 1, Agree — 2, Neutral — 3, Disagree — 4, Strongly Disagree — 5
29.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	
29.2	What does 'glad' mean?	
30	Being a VHT is an important part of how I see myself	Strongly Agree — 1, Agree — 2, Neutral — 3, Disagree — 4, Strongly Disagree — 5
30.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	
30.2	If I ask 'how do you see yourself' what do you think? Does this question make sense?	
31	I identify with iCCM trained VHTs	Strongly Agree — 1, Agree — 2, Neutral — 3, Disagree — 4, Strongly Disagree — 5
31.1	*Say:* Please tell me what this statement means in your own words? *If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask:* how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*	
32	I identify with my local VHT	Strongly Agree — 1, Agree — 2, Neutral — 3, Disagree — 4, Strongly Disagree — 5

7

32.1	*Say:* Please tell me what this statement means in your own words?
	If respondent's answer indicates they haven't understood the statement as intended, explain the meaning of the item (using the item meaning description sheet) and ask: how could this statement be worded differently to make the meaning clearer? *Probe for terms that are unclear and whether there are other words that would be better to use*

Part 4: Language

[Say:]

Today and in the past we aimed to interview you in English with the assistance of local language translations for some key words. The language/s we used today was/were (**add name of language/s used**).

[Ask:]

4.1	How well today and in the past have you understood questions in English? *If relevant, ask:* What helps your understanding?
4.2	Apart from the languages used today which other languages could you be interviewed in?

9.9   Matrix of polychoric correlation coefficients for the VHT work motivation variables

Table 9.3: Matrix of polychoric correlation coefficients for the VHT work motivation variables

Motivation Variable[a]		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	fsatis	1.00																						
2	fworth	0.21	1.00																					
3	fneed	0.13	0.29	1.00																				
4	fworks	0.27	0.23	0.34	1.00																			
5	frespec	0.28	0.21	0.13	0.30	1.00																		
6	fmotiva	0.04	-0.07	-0.11	0.14	0.11	1.00																	
7	fbenefit	-0.08	-0.15	-0.12	0.12	-0.02	0.24	1.00																
8	fperf	0.36	0.16	0.19	0.50	0.27	0.23	0.05	1.00															
9	fproud	0.39	0.23	0.28	0.47	0.37	0.16	0.10	0.56	1.00														
10	fcommit	0.32	0.14	0.21	0.53	0.40	0.14	0.07	**0.65**	**0.69**	1.00													
11	fachiev	0.35	0.25	0.26	0.52	0.24	-0.04	-0.08	0.49	0.37	0.52	1.00												
12	fstop	0.21	0.23	0.11	0.24	0.04	0.36	-0.01	0.23	0.40	0.21	0.22	1.00											
13	fcomple	0.21	0.16	0.13	0.43	0.18	0.10	0.00	0.46	0.53	0.49	0.38	0.32	1.00										
14	fwill	0.33	0.21	0.16	0.51	0.20	0.17	0.12	0.53	0.50	0.52	0.44	0.23	0.61	1.00									
15	fsense	-0.01	0.18	0.12	0.19	0.11	-0.16	-0.23	0.17	0.05	0.21	0.22	0.03	0.06	0.15	1.00								
16	fbest	-0.02	0.06	-0.04	-0.03	-0.06	-0.20	-0.30	-0.09	-0.21	-0.13	0.00	-0.21	-0.06	-0.11	0.01	1.00							
17	fevery	0.02	0.08	0.16	-0.02	0.08	-0.09	-0.11	0.12	0.00	0.06	0.04	-0.16	-0.02	0.01	0.10	0.06	1.00						
18	fstay	0.37	0.31	0.35	0.37	0.28	0.18	-0.04	0.49	0.58	0.45	0.38	0.58	0.48	0.52	0.16	-0.08	-0.08	1.00					
19	fignore	-0.04	-0.02	0.05	-0.08	0.01	0.06	0.04	-0.11	0.00	-0.09	-0.12	0.15	0.04	-0.11	-0.04	-0.06	0.06	0.07	1.00				
20	fgood	0.20	0.14	0.15	0.20	0.24	-0.04	-0.01	0.25	0.34	0.28	0.33	0.16	0.28	0.19	0.19	-0.04	0.07	0.40	0.22	1.00			
21	fdreams	0.33	0.27	0.34	0.41	0.37	-0.01	0.01	0.54	0.39	0.51	0.44	0.15	0.31	0.48	0.13	0.09	0.19	0.43	0.09	0.27	1.00		
22	fsolve	0.20	0.20	0.15	0.27	0.20	-0.22	-0.21	0.32	0.18	0.41	0.34	0.04	0.29	0.20	0.24	0.17	0.24	0.18	0.00	0.30	0.38	1.00	
23	fknow	0.22	-0.01	0.21	0.45	0.41	0.23	0.11	0.49	0.60	0.56	0.36	0.21	0.46	0.54	0.12	-0.30	-0.04	0.44	-0.09	0.11	0.40	0.06	1.00

[a] Table 4.8 contains the full item wording alongside the variable names.

(NB: variable 'fhelp' had been removed prior to the calculation of correlation coefficients reducing the total number of items to 23)

9.10 Free association grid for VHT associative interviews

Interview number:	Interviewer:	Location:
ASK: We are interested in what you associate with being a VHT. Please list the different feelings, words or images you associate with being a VHT using these boxes. Please include everything you associate with one feeling, word or image into one box.		

1.	2.
3.	**4.**

9.11 Grid method instructions for interviewers for VHT associative interviews

1. Identify and introduce yourself to the respondent.

2. Find a quiet place to conduct interview

3. Run through informed consent process and have respondent sign the consent form

4. Commence recording

5. Make a note on the grid form of the interview number, your name and the location

6. Begin interview by asking respondent to indicate images words and feelings they associate with being a VHT in each of the four boxes

7. Ask respondent to elaborate on each of the boxes in the order they were completed. For each elaboration:

   a. Draw out the respondent's narrative by demonstrating encouraging body language, nodding, and asking them to 'please tell me more', 'please continue' and 'is that all you can tell me or is there any more'.

   b. Further draw out the respondents stories by asking 'what happened before / after /then?

   c. Once the respondent has completely elaborated on each of the boxes ask immanent questions (i.e. questions based on the question list but using the words and references of the respondent) if the respondent has raised relevant content

   d. Do not point out any apparent contradictions or inconsistencies

8. Thank the respondent for their time and switch off the digital recorder

9. Informally engage with the participant and discuss any issues or elaborations they may wish to share

10. Make a note of the respondent's final reflections and thoughts and add them to the verbatim transcription of the interview.

9.12 Exmanent questions (to be converted into immanent ones) for VHT associative interviews
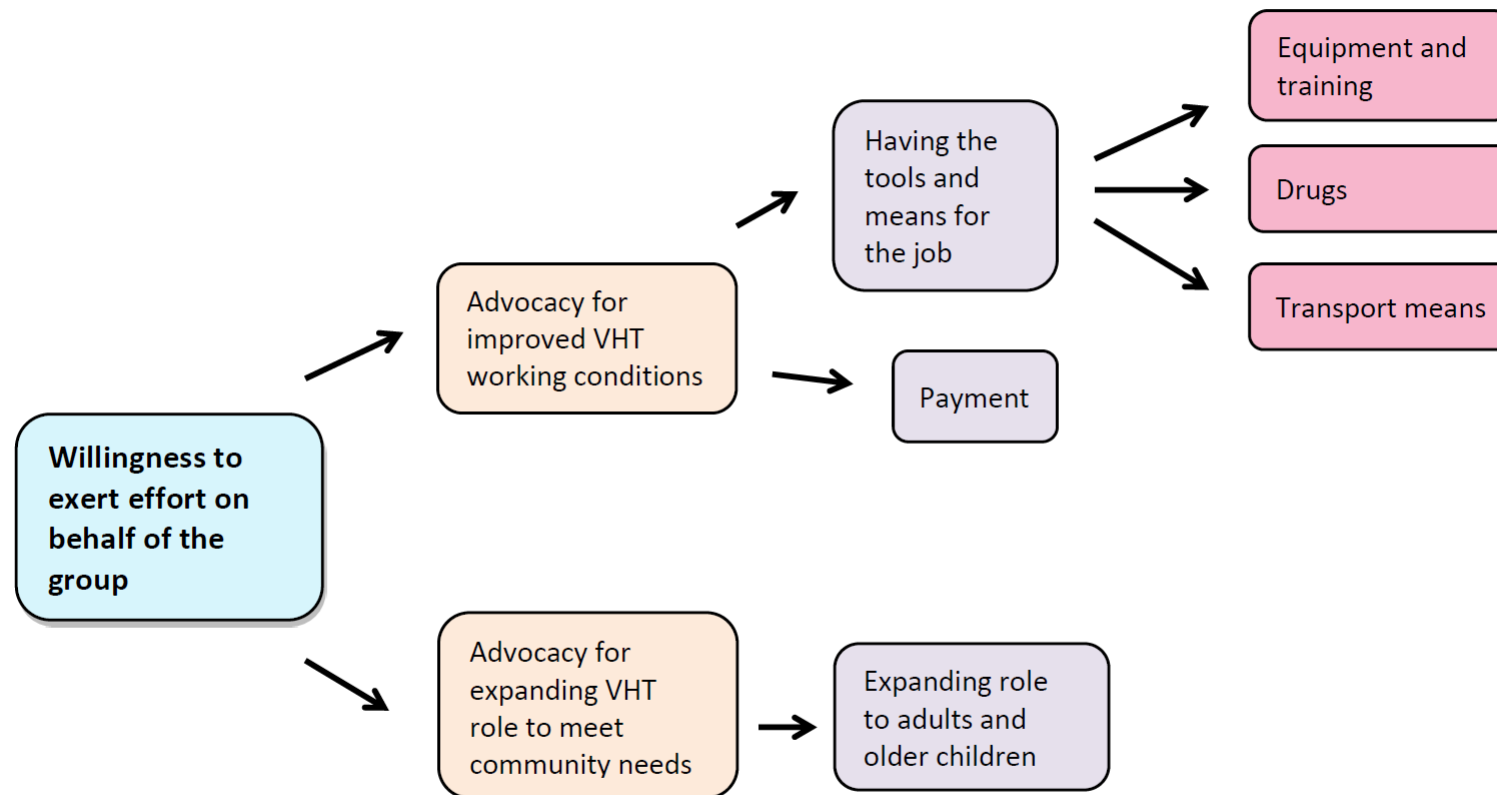
1. **IDENTITY.** What makes a VHT – i.e. the key features of the identity? Probe anything around how aspects of the role make them feel, what they do that is typical of the role and what the purpose of the role is.

2. **VALUE OF ROLE.** What makes being a VHT of value or important to the VHT (if indeed it does)? Particularly probe any aspects of the intervention that may be seen to enhance the value or importance of the role.

3. **HOW WIDE IS THE COLLECTIVE?** What collective of VHTs does the respondent feel part of (i.e. local, iCCM trained, sub county, district, other)? (NB: do not explicitly ask but instead be aware of when this might emerge and encourage elaboration).

4. **GOAL COMPATABILITY.** Are the respondent's goals and interests the same as the VHT programme? Encourage elaboration of aspects of their experience that seem to fulfil and satisfy the respondent.

5. **VHT WORK ETHIC.** Is the respondent willing to work hard for what they think the VHT programme needs? What are the most important needs for the VHT?

6. **SUPPORT NETWORKS.** Understand the respondents support networks whether they be in the community, from colleagues or supervisors or others.

7. **OPERATIONAL ENVIRONMENT AND PRACTICE.** Encourage elaborations of decision making and confidence to take action as a VHT as well as anything that provides context to their working environment and helps or hinders their work.

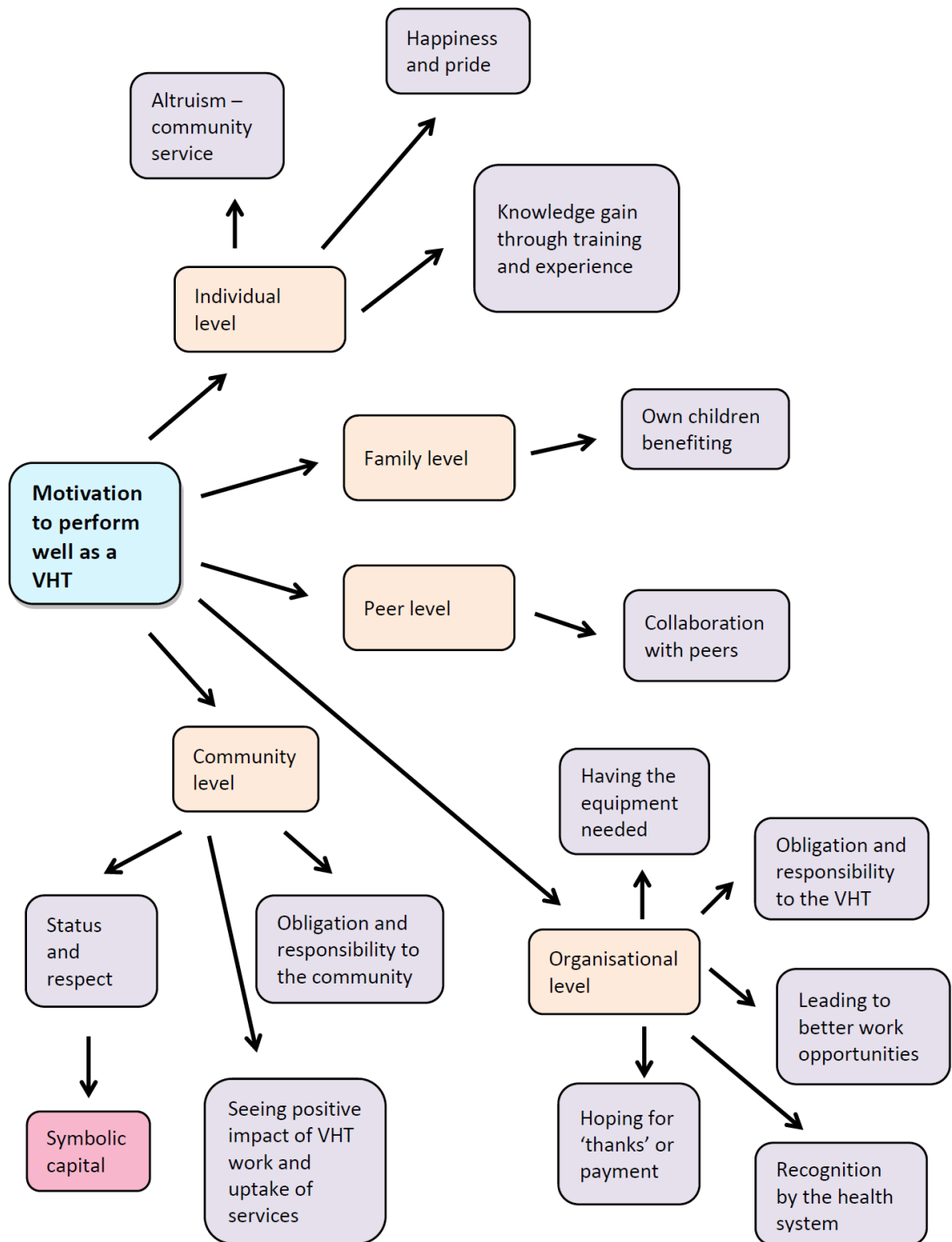## 9.13 Post data analysis coding frames for VHT associative interviews

Coding frame 1: Group Identification
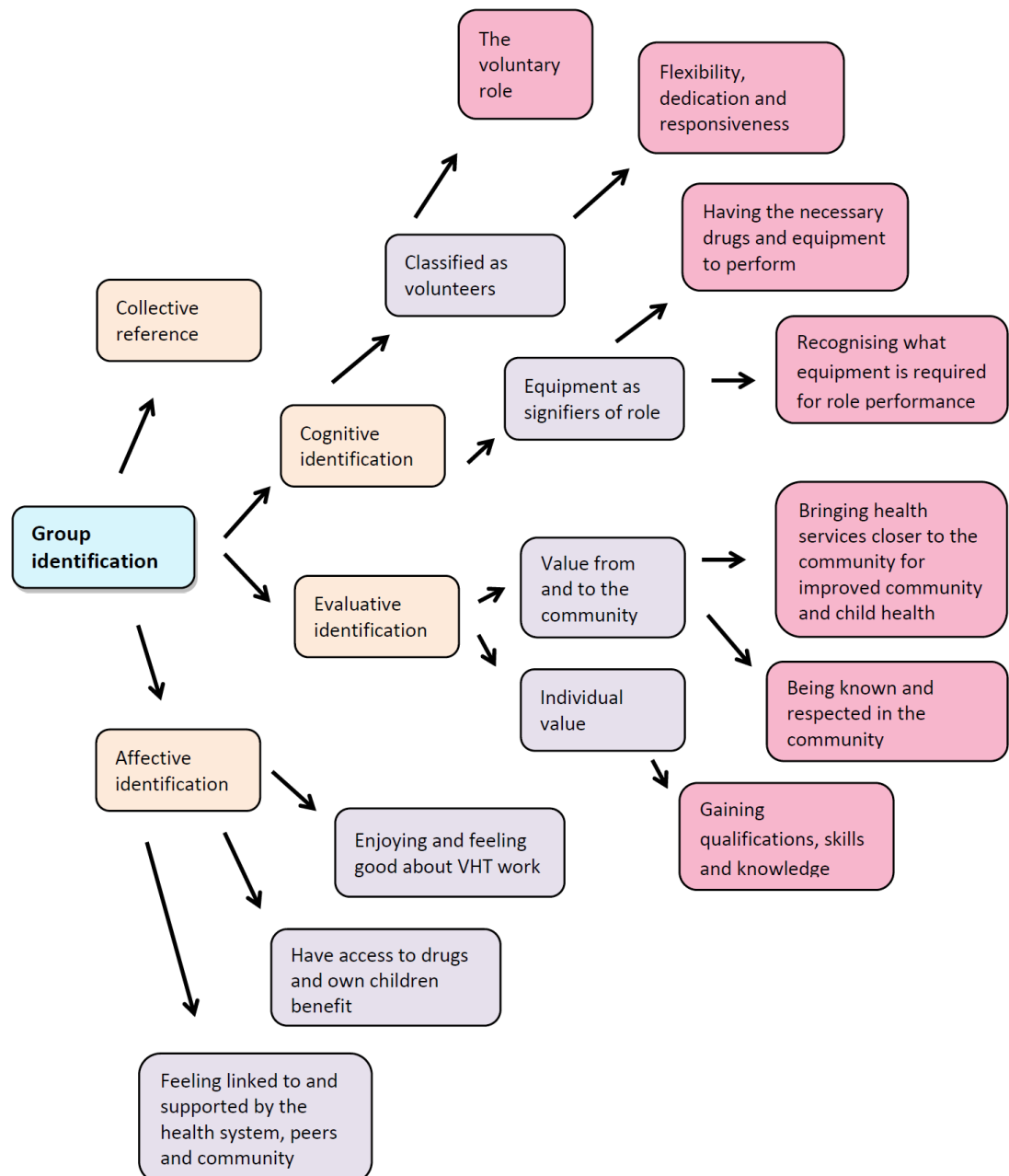
Coding frame 2: Willingness to exert effort on behalf of the group

Coding frame 3: Motivation to perform well as a VHT

- Happiness and pride
- Altruism – community service
- Knowledge gain through training and experience
- Individual level
- Motivation to perform well as a VHT
- Family level
- Own children benefiting
- Peer level
- Collaboration with peers
- Community level
- Status and respect
- Symbolic capital
- Obligation and responsibility to the community
- Seeing positive impact of VHT work and uptake of services
- Having the equipment needed
- Organisational level
- Obligation and responsibility to the VHT
- Leading to better work opportunities
- Hoping for 'thanks' or payment
- Recognition by the health system

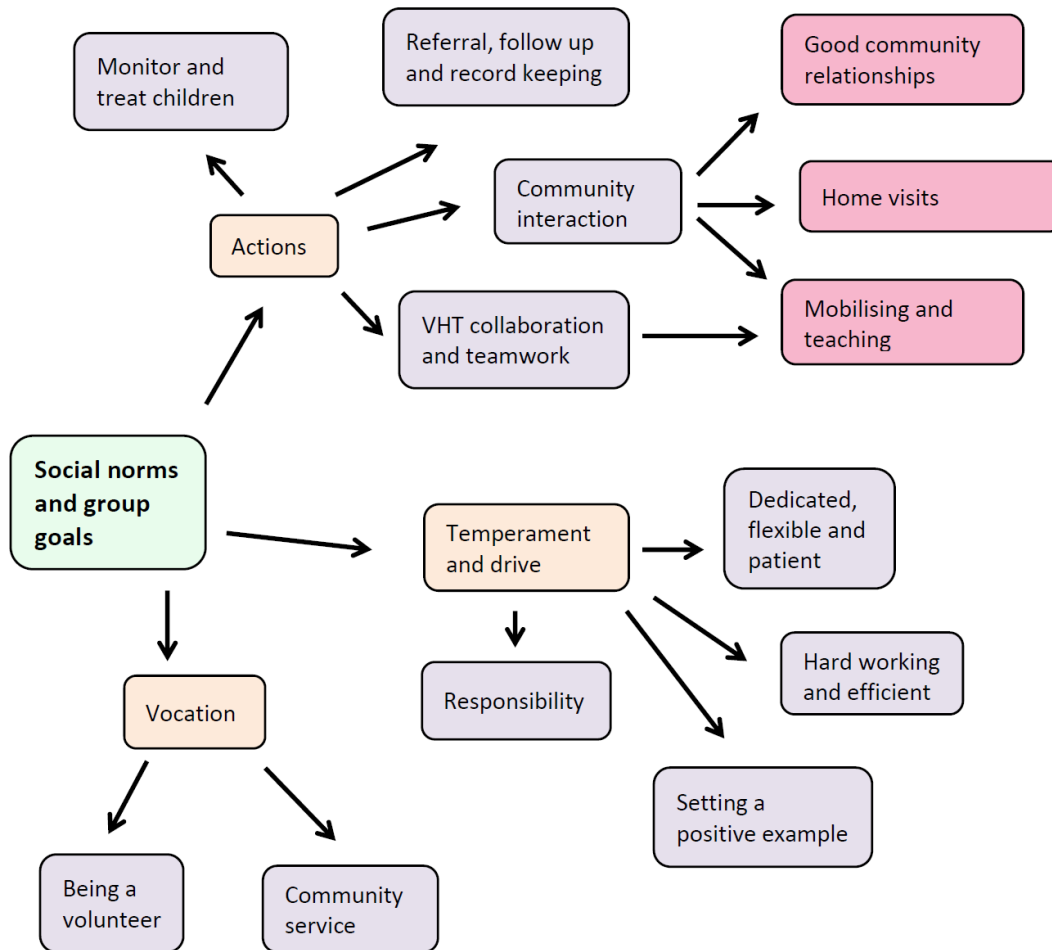## Coding frame 4: Performance and experience of performance outcomes
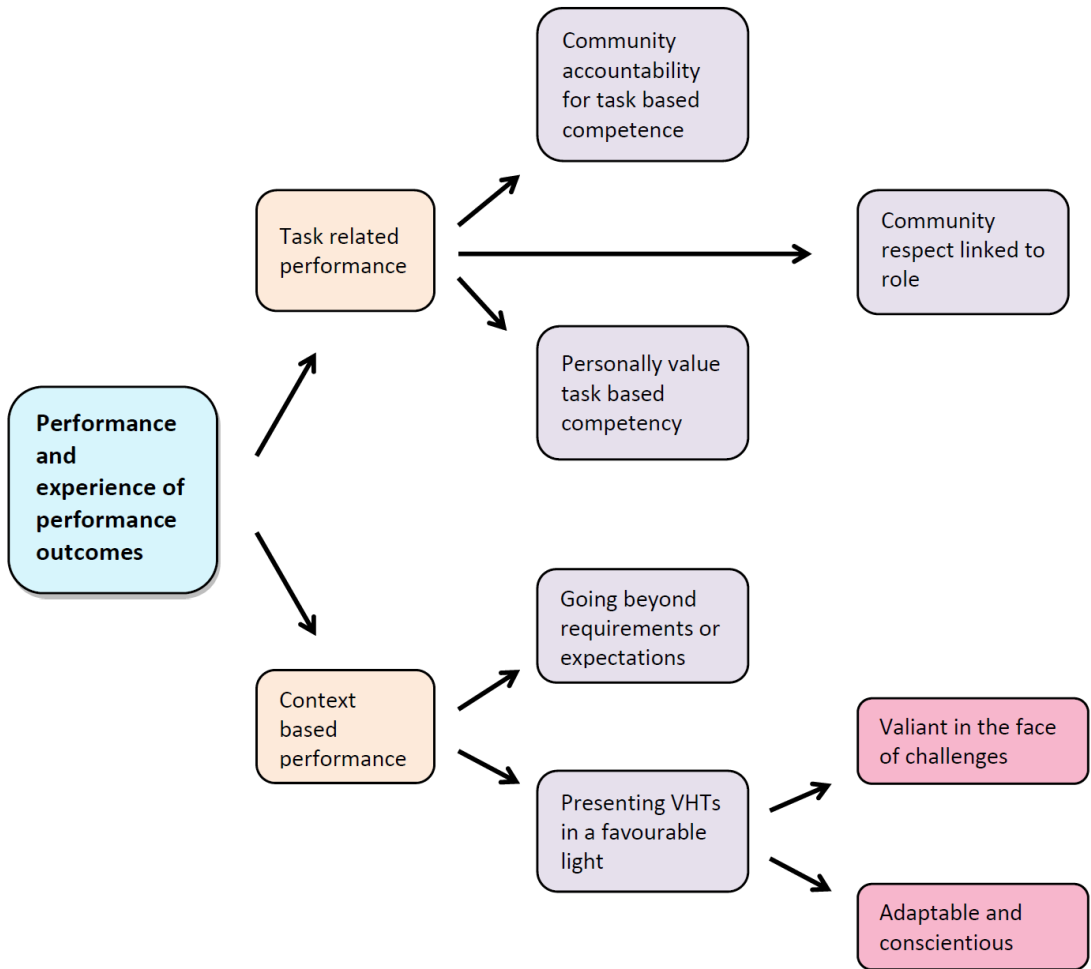
Coding frame 5: Social identity salience

Lack of needed equipment and drug supplies

Opportunity cost of being 'on-call'

Challenging questions and people

Community perception that VHTs are paid

Community demand and appreciate VHT service

Work challenges

Equipment as signifiers of role

Community as comparison out-group

Social identity salience

Community interaction

VHTs minister services to the community

Village health clubs

Health system interaction

Peer interaction

Being a team member

Validation of role through communication

Sharing knowledge and mutual support

Via provided phones

Via supervision

Coding frame 6: Perception of group goals and norms

Coding frame 7: Extent to which performance is under volitional control