Extent of Social Inequalities in Disability in the Elderly: Results from a Population-based Study of British Men

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Abstract

Purpose: Little is known about social inequalities in disability in the elderly. We examined the extent and determinants of socio-economic inequalities in disability and functional limitation in elderly men in Britain.

Methods: Disability was ascertained as problems with activities of daily living (ADLs) and instrumental activities of daily living (IADLs) in a socio-economically representative sample of 3981 men from 24 British towns aged 63-82 in 2003. We also examined functional limitation. Measures of socio-economic position were social class, age at leaving full-time education, and car and house ownership.

Results: Men in lower social classes had higher risks of both ADL and IADL disability and functional limitation compared with higher social classes; odds ratios (95%CI) for social class V compared with I were 3.13 (1.64–5.97), 2.87 (1.49–5.51) and 2.65 (1.31–5.35) respectively. Behavioural risk factors (smoking, BMI, physical activity) and particularly co-morbidity attenuated these differences; together they reduced relative risks to 1.11 (0.49–2.51), 1.01 (0.45–2.25) and 1.05 (0.46–2.42). Age at leaving full-time education had no relation to functional limitations after taking social class into account. Men who were not house or car owners had higher odds of functional limitation and ADL disability compared to house or car owners, independent of behavioural risk factors, comorbidities and social class.

Conclusion: Strong socio-economic inequalities in disability exist in the elderly, which were considerably explained by behavioural factors and comorbidity. Policy efforts are needed to reduce the social disparities in disability in the elderly.

Keywords: Disability, social inequalities, elderly

Abbreviations: ADLs, activities of daily living; BMI, body mass index; CVD, cardiovascular disease; CI, confidence intervals; IADLs, instrumental activities of daily living

Introduction

Disability has been defined as limitation or loss of the ability to perform social roles and activities in relation to family, work or independent living.(1-3) With increasing life expectancy, improving the quality of life is an important dimension of improving the health of the elderly population. The process underlying developing disability has been elaborated using a socio-medical model according to which, social, personal and environmental factors operate to speed or slow the disablement process.(2) These factors act in different ways – risk factors which could be demographic, lifestyle, or biological can predispose an individual to having disability, whereas interventions, including medical care, rehabilitation, assistance, built/social environment can reduce the impact of disability.(2) Within this framework the impact of socio-economic conditions on disability is vital, because of their influence on these factors underlying the disablement process. Inequalities in health in relation to socioeconomic status are well documented for morbidity as well as for mortality and life expectancy.(4) Cardiovascular disease (CVD) and arthritis, two chronic diseases strongly associated with disability,(5-7) also show strong social gradients.(8,9) However, social inequalities in disability in the elderly have been less studied than other health outcomes. Previous studies have reported important socio-economic disparities/inequalities in disability and functional mobility or limitations.(10-15) However, the focus has largely been on functional mobility/limitations, and the extent of social inequalities in disability is less reported. While functional limitation and disability are related, they are not identical. Disability is an expression of functional limitation in a social context; functional limitations refer to problems in carrying out a task, whereas disability is difficulty in performing social roles.(2,16)

This paper aims to describe the burden or extent of social inequalities in disability in the elderly in Britain. Measures of disability in the form of problems in performing basic activities of daily living (ADLs) such as eating, dressing, bathing, and problems in coping with instrumental activities of daily living (IADLs) like shopping, using the telephone, and managing money,(2,17,18) have been

used. These markers of disability not only form the core constructs of disability, but are also indicative of the quality of life in the elderly. In addition to disability, we also measured functional limitations, which are important predictors of disability.(19) Socio-economic position was measured by social class based on the longest-held occupation of the subjects to obtain a stable measure of socio-economic conditions in adult life. Since measuring socio-economic position in the elderly is difficult to characterize,(20) we explored social inequalities in disability using additional markers of socio-economic conditions such as education, and house and car ownership. We also investigated the impact of behavioural factors and presence of disease on the relationship between socio-economic conditions and disability. This study was carried out in a socio-economically and geographically representative sample of older British men aged 63-82 years in 2003.

Methods

The British Regional Heart Study is a prospective population-based study of cardiovascular disease comprising a socially and geographically representative sample of 7735 men aged 40-59 years in 1978-80 drawn from one general practice in each of 24 towns representing all major British regions.(21) Subjects have been followed-up for all-cause mortality and have completed questionnaires at regular intervals. In 2003, when the men were aged 63-82, information on disability, presence of disease, behavioural factors, and socio-economic circumstances was sought; these data were used for this paper. Additional information on occupational social class was available from baseline, and information on education was collected in 1996.

Disability was ascertained as problems with ADLs and IADLs from a self-completed questionnaire. ADLs included performing the following activities unaided – walking across a room, getting in/out of bed, getting in and out of a chair, dressing and undressing yourself, bathing/showering, feeding yourself including cutting food, and getting to and using the toilet. IADLs included – shopping for personal items such as toilet items or medicines, doing light housework such as washing up,

preparing your own meals, using the telephone, taking medications, managing money (e.g. paying bills, etc), and using public transport. Reporting of some difficulty or inability/needing help to do one or more of the items was taken a having problem with ADLs or IADLs. These are established markers of disability used in previous studies.(14,22,23) One or more of the following responses was taken as a functional limitation – walking more than a few steps but less than 200 meters or only a few steps without stopping and without discomfort; unable to walk up and down a flight of 12 stairs without resting or only by holding and taking a rest; and unable to bend down when standing and pick up a shoe from the floor.

Information on different markers of socio-economic position was collected in the study including social class, education, and car and house ownership. The longest-held occupation of each man was recorded at study entry when aged 40-59, and categorised using the Registrar Generals' Social Class Classification (I, II, III non-manual, III manual, IV and V). Subjects were grouped into three categories according to their age at leaving full-time education, which was asked in a questionnaire in 1996: <14 years, 14-18 years and >18 years. In the questionnaire in 2003, subjects were asked if they had a car available for their own use, and whether they owned their house/accommodation; this was used to assess car and house ownership as markers of socioeconomic position in addition to social class and education.

Behavioural factors: In the questionnaire in 2003 detailed questions were asked on smoking habits, physical activity and body weight. Physical activity scores were assigned on the basis of frequency and type of activity, and divided into six groups: none, occasional, light, moderate, moderately-vigorous and vigorous. Scores of none and occasional were used to classify physically inactive subjects. Body mass index (BMI) was calculated as body weight/(height)^2 in kg/m^2. Obesity was defined as BMI of ≥30.

Co-morbidities: Subjects were asked to report doctor diagnosis of the following conditions – cardiovascular disease (heart attack, angina and stroke), diabetes, cancer, arthritis, and respiratory disease (asthma, emphysema, bronchitis, pneumonia). They were also asked to describe their health status as excellent, good, fair or poor.

Statistical analyses

Multiple logistic regression was used to assess the relation between socio-economic conditions (social class groups, age at leaving full-time education, and car and house ownership), and disability (problems with ADLs and IADLs) and functional limitation. Odds ratios with 95% confidence intervals (CI) for these outcome measures were obtained using social class I, <14 years at leaving full-time education, car owner and house owner as reference categories. Social class and age at leaving full-time education were also fitted as continuous variables to obtain regression coefficients and odds ratio (95%CI) per unit increase of these scores. Age, behavioural factors, and comorbidity were adjusted for in different models. The effects of education and house and car ownership were adjusted for social class. For the adjustment, age and BMI were fitted as continuous variables; social class (five levels), smoking (six levels) and physical activity (five levels) were fitted as categorical variables.

Results

3981 men aged 63-82 responded to the questionnaire in 2003 (80% response rate). The overall prevalence of problems with ADLs, IADLs, and functional limitation were 16%, 15% and 21% respectively. Prevalences of disability and functional limitations in men with and without comorbidity are presented in figure 1. Prevalence of disability and functional limitation (3-4%) was lowest in men without co-morbidities. Approximately 25-35% of men with CVD, arthritis and respiratory diseases had disability and functional limitations. 40-50% of men reporting fair/poor health had disability and functional limitations. The prevalence of these specific forms of

comorbidity also varied according to social class as seen in table 1. Men from manual social class groups (social classes IIImanual, IV and V) had a higher prevalence of diseases particularly cardiovascular disease, arthritis and respiratory diseases. The proportions reporting fair or poor health were also higher in subjects of manual social classes. Men with adverse behavioural risk factors also had higher prevalence of disability and functional limitation compared with non-smokers, non-obese and physically active (see table 2).

There were approximately graded relations between social class, disability and functional limitations (table 3). Men in manual social class groups had approximately three times higher odds of having functional limitations compared to social class I. Similarly men from manual social class groups had higher odds of having ADL and IADL disability compared to social class I. These associations were weakened after adjustment for behavioural risk factors and particularly after adjustment for co-morbidities. The effect of attenuation was particularly marked in social class V. The relationship of social class and ADL disability was no longer significant after these adjustments.

A higher age of leaving full-time education was associated with lower odds of having functional limitations, but not with ADL and IADL disability (table 4). The association of education with functional limitation was attenuated after adjustment for social class (table 4). Men who did not own a house or car had a 2.5 to 3 fold higher relative risk of having functional limitations, and ADL and IADL disability (table 5) compared to those who owned a house or car. The association of house ownership with IADL disability was not significant after adjusting for behavioural factors, comorbidities and social class. The relationship of house ownership with functional limitation and ADL disability, although was weakened, remained after adjustment for behavioural factors, comorbidities and social class. Similar associations were observed for car ownership with disability and functional limitation.

Discussion

In this study of older British men, strong social class gradients were apparent both in disability and functional limitations; men from lower social class groups had an increased risk of having disability and functional limitation. Differences in disability according to house and car ownership were also present and were greater than social class inequalities. These socio-economic disparities were considerably explained by presence of comorbidities and behavioural factors.

The results highlight strong socio-economic inequalities in disability in a socially and geographically representative sample of older British men, using measures of disability including ADL and IADL disability, as well as functional limitations. Since the measures of disability were based on self-report, it is possible that this was influenced by presence of disease resulting in reporting bias. However, self-report of disability is an important evaluation tool for the health of older populations,(6) and problems with ADLs and IADLs are widely used measures of disability.(6,14,15,22) Self-report of disability using these measures have been found to be reliable and valid although they may not be consistent over an extended time due to change in disease status or use of interventions.(24) Objective measures may be better at capturing functional impairments/limitations but may not reflect the extent of disability, which is a manifestation of functional limitations in a social context.(2) In this paper, we also examined functional limitation since it is a key precursor of disability.(19) It is possible that self-report of fair/poor health may have been influenced by presence of disability. However, self-report of health, known to be related to underlying disease and mortality,(25,26) is a useful proxy measure of underlying comorbidities which need to be taken into account when assessing the association between socio-economic conditions and disability. We used a range of different measures of socio-economic conditions in our elderly subjects including social class, age at leaving full-time education, and car and house ownership. The association of car and house ownership with disability appeared to be stronger than and independent of social class. Although, car ownership in the elderly may be influenced by poor

health and disability, previous evidence from our study has shown that car ownership in middle-age (45-64 years) was prospectively related to developing locomotor disability in later life.(27) Earlier studies have shown that measures of material wealth such as car and house ownership are stronger markers of socioeconomic conditions than occupational social class.(28,29) In our results, despite strong social gradients in disability according to social class, there were no differences in ADL and IADL disability according to education especially after taking into account pre-existing disease and behavioural factors. The association of education with functional limitations was also no longer significant after taking into account occupational social class. This could be because education was not a strong marker of socio-economic status in old age. The main measure of socio-economic position in our study was social class based on the longest-held occupation of the subjects. Occupational social class measures can be problematic in the elderly in post-retirement age. However, in our study social class was based on the longest-held occupation which was collected when the men were 40-59 years. Therefore, we believe that it provides a stable marker of socio-economic conditions over most of the adult life.

Our results are consistent with previous studies which have shown that poorer or worse socio-economic conditions are associated with greater levels of disability.(10-15) While previous studies have mostly used functional limitations or mobility problems, we have also explored the extent of inequalities in disability as measured by problems with performing ADLs and IADLs. In our results men with adverse behavioural risk factors including smoking, physical inactivity and obesity had higher levels of functional limitation and disability. Although, our study is cross-sectional, these behavioural factors have previously been shown to be strong predictors of developing mobility problems and disability in later life.(5,30) Chronic diseases particularly cardiovascular disease, arthritis and diabetes also greatly increase the risk of disability in old age.(7,31) Behavioural factors and particularly comorbidities were largely responsible for the social class differences, especially for ADL disability but also to some extent for IADL disability and functional limitations. The greater

relative risks for disability in manual social class groups were nearly halved after controlling for behavioural risk factors and pre-existing disease. The effect of attenuation was particularly strong in social class V, possibly due to higher levels of comorbidities and adverse behavioural risk factors in this social class group. The increased risk of functional limitation in social classes III manual and IV, on the other hand, remained significant even after the adjustments. Apart from behavioural factors and comorbidity, other pathways could be linking socio-economic status and disability including poorer access to services or resources, rehabilitation, and worse living conditions.(32-34) All of these contribute to increased chances of developing disability or retard the process of recovering from or coping with functional decline or disability.(2,34) In this study we were unable to control for or take into account the availability of coping mechanisms or the lack of it on inequalities in disability.

An understanding of pathways underlying disability or the 'disablement process'(2) has direct implications for health policy to reduce the burden of disability and inequalities in disability. First, improving the overall health of the elderly is important because of the strong association between disease and disability. Comorbidities were to a large extent responsible for the social differences in disability in this study. Second, continued efforts on reducing levels of behavioural factors such as smoking, physical inactivity and obesity are needed. Although these may be regarded as 'individual' risk factors, they are influenced by the social context,(35,36) and therefore policy plays a vital role in reducing these factors in the population. Change in lifestyle including smoking cessation and taking up physical activity even later in life has been shown in our cohort to have the potential to reduce onset of mobility limitations and improve recovery from disability in the elderly.(37) Third, adequate rehabilitation, interventions and care would be needed to cope with functional decline in old age. The ability to perform tasks for independent living and functioning in old age is not only dependent on the functional ability of older people but also on the facilities available in the physical or environmental context they live in.(2,34,38) This implies provision for the needs of older people in housing and environmental policies. While trials have been conducted to study the effectiveness of

interventions to reduce the impact of disability,(39,40) more such evidence is needed to understand ways of reducing disability, particularly among the socially disadvantaged. Evaluation of the effectiveness and cost-effectiveness of interventions targeted at reducing inequalities in disability in the elderly are needed. These implications and efforts will address issues which particularly affect lower socio-economic groups who are more vulnerable to disability.

Conclusions

Socio-economic inequalities in disability exist in old age. Our findings show about a three fold higher risk of disability among older British men of lower compared to higher socio-economic groups. Just as disability reflects the overall impact of diseases/comorbidities in older people,(6) social inequalities in disability in the elderly can be indicative of the overall extent of health inequalities in later life. Policy efforts, for tackling determinants of disability and improving recovery from disability, are needed to reduce the overall burden of disability in later life as well as to reduce the greater burden of disability experienced by those in lower socio-economic groups.

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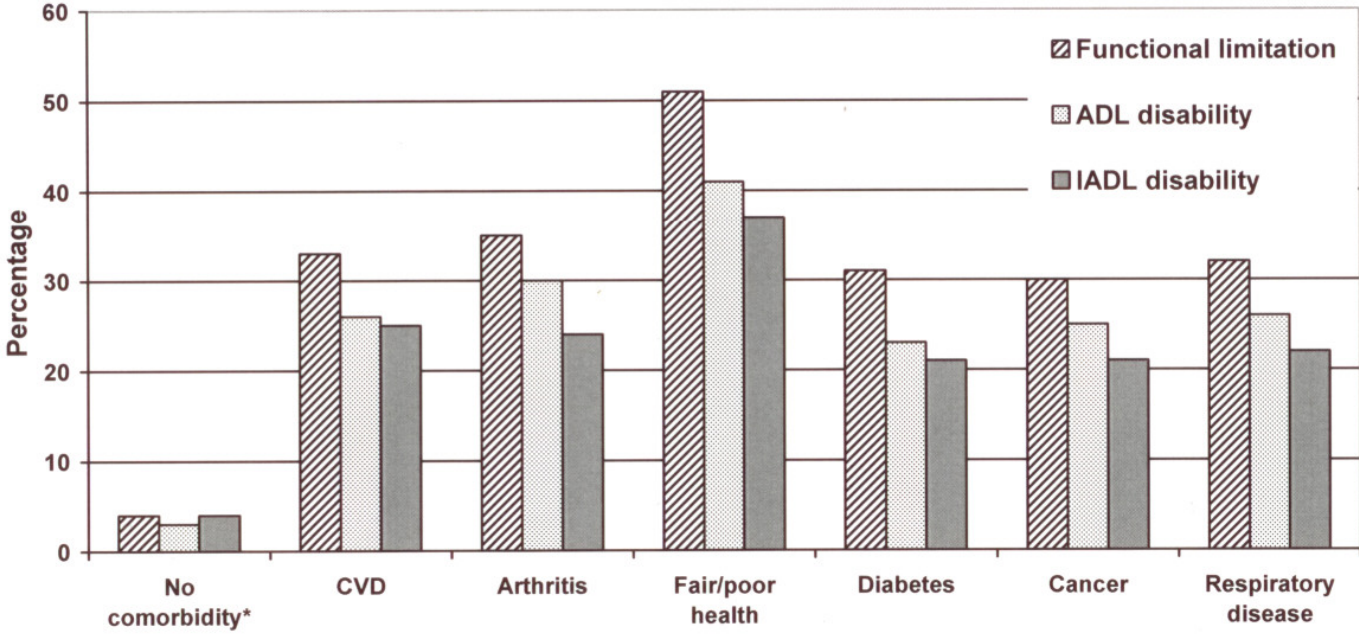
Figure 1: Prevalence of Disability and Functional Limitations in Men from the British Regional Heart Study Aged 63-82 with Chronic Diseases



*'No comorbidity' included men with no history of cardiovascular disease (CVD), arthritis, cancer or respiratory disease, no self-report of fair/poor health, diabetes, and no history of other co-morbidities including heart failure, high blood pressure, aortic aneurysm, deep vein thrombosis, pulmonary embolism, gout, osteoporosis and Parkinson's disease

Table 1 Prevalence of Chronic Diseases in 2003 According to Social Class in Men Aged 63-82 from 24 Towns in Britain

Social class	Cardiovascular disease	Arthritis	Self-report of fair/poor health	Diabetes	Cancer	Respiratory disease
I	83 (21%)	106 (28%)	50 (13%)	31 (8%)	34 (9%)	90 (24%)
II	293 (27%)	335 (31%)	252 (23%)	102 (9%)	103 (9%)	244 (23%)
IIINM	116 (29%)	124 (32%)	112 (28%)	44 (11%)	40 (10%)	101 (26%)
IIIM	425 (29%)	559 (38%)	490 (33%)	159 (11%)	116 (8%)	365 (26%)
IV	100 (30%)	127 (38%)	131 (39%)	35 (11%)	29 (9%)	97 (30%)
V	39 (37%)	46 (46%)	48 (45%)	10 (10%)	7 (7%)	24 (25%)

Table 2 Prevalence of Functional Limitation and Disability According to Behavioural Risk Factors

Behavioural risk factors	**Functional limitation**	**ADL disability**	**IADL disability**
Smoking			
Current smokers - n (%)	117 (31%)	85 (22%)	76 (21%)
Non-smokers - n (%)	689 (20%)	547 (16%)	492 (14%)
Obese - n (%)	280 (31%)	216 (24%)	189 (21%)
Non-obese - n (%)	492 (17%)	393 (14%)	360 (13%)
Physically activity			
Inactive - n (%)	593 (39%)	460 (30%)	439 (29%)
Active - n (%)	174 (8%)	135 (6%)	103 (5%)

Table 3 Percentages and Odds Ratios (95% CI) for Functional Limitations and Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) Disability in 2003 According to Social Class

	Social class							
	I	II	IIINM	IIIM	IV	V	Social class (trend)	P for trend
Functional limitation								
Number (%)	32 (9)	120 (13)	59 (17)	297 (24)	74 (28)	18 (23)		
Adjusted for age and behavioural factors	1.00	1.38 (0.91, 2.09)	1.99 (1.25, 3.16)	3.12 (2.11, 4.61)	3.69 (2.34, 5.82)	3.13 (1.64, 5.97)	1.39 (1.29, 1.49)	<0.0001
Adjusted for age and comorbidities*	1.00	1.25 (0.78, 2.01)	1.58 (0.92, 2.69)	2.77 (1.77, 4.34)	2.72 (1.59, 4.65)	2.27 (1.06, 4.85)	1.32 (1.21, 1.44)	<0.0001
Fully adjusted model†	1.00	0.99 (0.61, 1.63)	1.13 (0.64, 1.98)	2.02 (1.26, 3.24)	1.98 (1.12, 3.51)	1.11 (0.49, 2.51)	1.23 (1.12, 1.35)	<0.0001
ADL disability								
Number (%)	32 (9)	106 (11)	59 (17)	212 (17)	56 (21)	17 (22)		
Adjusted for age and behavioural factors	1.00	1.21 (0.79, 1.83)	2.00 (1.26, 3.18)	2.02 (1.37, 3.00)	2.57 (1.60, 4.11)	2.87 (1.49, 5.51)	1.26 (1.17, 1.36)	<0.0001
Adjusted for age and comorbidities*	1.00	1.06 (0.67, 1.68)	1.64 (0.98, 2.75)	1.57 (1.01, 2.45)	1.67 (0.98, 2.86)	2.07 (0.98, 4.35)	1.17 (1.07, 1.28)	0.0008
Fully adjusted model†	1.00	0.84 (0.52, 1.37)	1.20 (0.70, 2.07)	1.07 (0.67, 1.70)	1.11 (0.62, 1.97)	1.01 (0.45, 2.25)	1.06 (0.96, 1.17)	0.27
IADL disability								
Number (%)	28 (8)	96 (10)	46 (13)	198 (16)	59 (22)	14 (18)		
Adjusted for age and behavioural factors	1.00	1.24 (0.80, 1.93)	1.72 (1.04, 2.83)	2.17 (1.43, 3.29)	3.17 (1.95, 5.16)	2.65 (1.31, 5.35)	1.30 (1.20, 1.41)	<0.0001
Adjusted for age and comorbidities*	1.00	1.08 (0.66, 1.76)	1.32 (0.75, 2.30)	1.75 (1.09, 2.79)	2.23 (1.28, 3.88)	1.89 (0.85, 4.18)	1.22 (1.11, 1.35)	<0.0001
Fully adjusted model†	1.00	0.88 (0.53, 1.46)	1.00 (0.56, 1.79)	1.29 (0.79, 2.10)	1.60 (0.90, 2.86)	1.05 (0.46, 2.42)	1.14 (1.03, 1.26)	0.01

*Comorbidities included cardiovascular disease, arthritis, respiratory disease, diabetes, cancer, and self-report of poor/fair general health
†Age, behavioural factors and comorbidites

Table 4 Percentages and Odds Ratios (95% CI) for Functional Limitations and Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) Disability in 2003 According to Age at Leaving Full-time Education

	Age at leaving full-time education				
	<14 years	14-18 years	>18 years	Trend	P for trend
Functional limitation					
Number (%)	247 (26)	238 (15)	49 (12)		
Age-adjusted	1.00	0.66 (0.53, 0.83)	0.48 (0.34, 0.68)	0.69 (0.59, 0.80)	<0.0001
Adjusted for age and behavioural factors	1.00	0.63 (0.48, 0.82)	0.50 (0.33, 0.74)	0.68 (0.57, 0.82)	<0.0001
Adjusted for age and comorbidities*	1.00	0.66 (0.51, 0.86)	0.58 (0.40, 0.85)	0.73 (0.61, 0.88)	0.0007
Adjusted for age and social class	1.00	0.85 (0.67, 1.07)	0.86 (0.59, 1.26)	0.90 (0.75, 1.08)	0.25
Fully adjusted model†	1.00	0.73 (0.54, 0.98)	0.69 (0.43, 1.12)	0.80 (0.64, 1.00)	0.05
ADL disability					
Number (%)	172 (18)	207 (13)	50 (12)		
Age-adjusted	1.00	0.85 (0.67, 1.09)	0.76 (0.54, 1.08)	0.87 (0.74, 1.03)	0.09
Adjusted for age and behavioural factors	1.00	0.90 (0.68, 1.19)	0.92 (0.62, 1.37)	0.94 (0.78, 1.14)	0.53
Adjusted for age and comorbidities*	1.00	0.91 (0.68, 1.22)	1.07 (0.72, 1.60)	1.01 (0.83, 1.22)	0.95
Adjusted for age and social class	1.00	1.02 (0.78, 1.32)	1.21 (0.81, 1.80)	1.08 (0.89, 1.31)	0.44
Fully adjusted model†	1.00	0.95 (0.69, 1.32)	1.19 (0.74, 1.93)	1.06 (0.84, 1.33)	0.65
IADL disability					
Number (%)	168 (18)	176 (11)	44 (10)		
Age-adjusted	1.00	0.80 (0.62, 1.03)	0.72 (0.50, 1.04)	0.84 (0.70, 0.99)	0.04
Adjusted for age and behavioural factors	1.00	0.81 (0.60, 1.09)	0.83 (0.55, 1.26)	0.89 (0.73, 1.08)	0.23
Adjusted for age and comorbidities*	1.00	0.86 (0.65, 1.15)	0.96 (0.64, 1.44)	0.95 (0.78, 1.15)	0.60
Adjusted for age and social class	1.00	0.97 (0.74, 1.27)	1.14 (0.75, 1.27)	1.04 (0.85, 1.27)	0.71
Fully adjusted model†	1.00	0.93 (0.67, 1.28)	1.07 (0.66, 1.76)	1.01 (0.80, 1.27)	0.96

*Comorbidities included cardiovascular disease, arthritis, respiratory disease, diabetes, cancer, and self-report of poor/fair general health
†Age, behavioural factors, comorbidites and social class

Table 5 Percentages and Odds Ratios (95% CI) for Functional Limitations and Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) Disability in 2003 According to House and Car Ownership

	House owner			Car owner		
	Yes	No	P value	Yes	No	P value
Functional limitation						
Number (%)	426 (15)	167 (41)		422 (15)	175 (35)	
Age-adjusted	1.00	3.55 (2.83, 4.44)	<0.0001	1.00	2.60 (2.09, 3.22)	<0.0001
Adjusted for age and behavioural factors	1.00	2.50 (1.90, 3.29)	<0.0001	1.00	2.26 (1.73, 2.93)	<0.0001
Adjusted for age and comorbidities*	1.00	2.82 (2.16, 3.69)	<0.0001	1.00	1.85 (1.43, 2.39)	<0.0001
Adjusted for age and social class	1.00	2.94 (2.33, 3.71)	<0.0001	1.00	2.13 (1.70, 2.67)	<0.0001
Fully adjusted model†	1.00	2.15 (1.59, 2.91)	<0.0001	1.00	1.70 (1.27, 2.29)	0.0004
ADL disability						
Number (%)	353 (13)	125 (31)		335 (12)	145 (29)	
Age-adjusted	1.00	2.85 (2.24, 3.63)	<0.0001	1.00	2.68 (2.13, 3.37)	<0.0001
Adjusted for age and behavioural factors	1.00	1.89 (1.42, 2.53)	<0.0001	1.00	2.33 (1.78, 3.05)	<0.0001
Adjusted for age and comorbidities*	1.00	2.10 (1.58, 2.78)	<0.0001	1.00	1.99 (1.52, 2.61)	<0.0001
Adjusted for age and social class	1.00	2.49 (1.94 (3.19)	<0.0001	1.00	2.36 (1.85, 2.99)	<0.0001
Fully adjusted model†	1.00	1.68 (1.23, 2.31)	0.001	1.00	2.00 (1.47, 2.71)	<0.0001
IADL disability						
Number (%)	327 (12)	110 (27)		298 (11)	140 (28)	
Age-adjusted	1.00	2.53 (1.97, 3.25)	<0.0001	1.00	2.79 (2.21, 3.53)	<0.0001
Adjusted for age and behavioural factors	1.00	1.58 (1.17, 2.13)	0.003	1.00	2.45 (1.86, 3.24)	<0.0001
Adjusted for age and comorbidities*	1.00	1.70 (1.28, 2.25)	0.0003	1.00	1.92 (1.47, 2.50)	<0.0001
Adjusted for age and social class	1.00	2.14 (1.66, 2.78)	<0.0001	1.00	2.40 (1.87, 3.07)	<0.0001
Fully adjusted model†	1.00	1.26 (0.91, 1.73)	0.16	1.00	1.87 (1.38, 2.54)	<0.0001

*Comorbidities included cardiovascular disease, arthritis, respiratory disease, diabetes, cancer, and self-report of poor/fair general health
†Age, behavioural factors, comorbidites and social class