Running Head: Developing Resilient Systems

Title: Developing Inclusive and Resilient Systems: COVID-19 and Assistive Technology

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Emma M. Smith lead the preparation of the manuscript including concept development, literature review, and writing of the manuscript.

Malcolm MacLachlan contributed to concept development, interpretation of the literature, and writing of the manuscript.

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Catherine Holloway contributed to concept development, interpretation of the literature, and writing of the manuscript.

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Assistive technologies are products and systems which support individuals with disabilities to participate in daily life.(World Health Organization 2016) In doing so these technologies promote health and wellbeing, while helping to realise rights afforded by the United Nations Declaration on Human Rights and the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD).(World Health Organization 2016) There are currently over 1 billion people in the world who need access to assistive technology, with over 2 billion expected by 2050.(World Health Organization 2016) This includes persons with disabilities, older and ageing adults, and individuals with health conditions to lead fulfilled and independent lives. The Seventy-first World Health Assembly (2018) recognized the critical contribution of assistive technologies to promoting inclusion and participation in all areas of society, urging member states to develop policies and systems capable of providing assistive technologies through universal health or social services coverage.(World Health Assembly 2018)

The COVID-19 pandemic has far reaching implications for all sectors of society, however it is likely people with disabilities have been disproportionally affected by restrictions to movement, access to care, and the ability to exercise their fundamental rights.(Armitage and Nellums 2020) Underlying many of the issues faced by people with disabilities during this pandemic is poverty, with growing recognition of the complexity of the link between poverty and disability.(Groce et al. 2011) Assistive technology enables users to live fulfilled independent lives, and has the potential to be used for accessible health messaging (in the case of digital technology) which is even more important when services and support are scarce. However, in our experience, in some cases AT services have been deemed non-essential, and policy, systems, and regulatory frameworks have not kept pace with the changes required to deliver services effectively during a pandemic situation. A lack of systematic preparedness could be putting those already marginalized at even greater risk.

The challenges faced in assistive technology provision – lack of supply, demand mismatches for products, inadequate numbers of trained personnel, limitations in innovation systems and processes(Holloway et al. 2018) – are played out more widely in the COVID-19 pandemic. We have an opportunity to learn from the experiences of the COVID-19 pandemic to address the systemic and systematic changes required to ensure inclusive and resilient assistive technology services.

First, it is critical for countries to continue to work towards developing *sustainable infrastructure and policies* to support assistive technology use and service delivery as an essential service.(M. MacLachlan et al. 2018) These systems must be developed within a rights-based framework aligned with international law and global commitments to the UNCRPD. Their effectiveness will be directly linked to their engagement with a systems-based approach which acknowledges the complexity of assistive technology use at a societal level and the need for appropriate funding frameworks across all relevant government ministries, including universal access programs to address individual needs regardless of socio-economic status.(Malcolm MacLachlan and Scherer 2018)

Second, there is now an even greater need to develop *best practice service delivery models* which support the development and use of robust, accessible, tele-delivery systems capable of delivering the required services. Service delivery models must consider the requirements of the population, the essential nature of assistive technology, and the responsibility to protect both assistive technology users and service providers from infection during the assistive technology provision process.(de Witte et al. 2018)

Third, there is a need to develop more *accessible and affordable communication* tools which provide impairment-relevant and accessible information and support.(Qi and Hu 2020)

Particular attention must be paid to the needs of individuals with complex conditions who may not be able to access traditional media sources in the formats currently delivered. This is an area of private sector growth which should be harnessed by development actors and national governments.

Finally, and perhaps most importantly, *assistive technology users must be central* to the planning required to address the lessons learned in an inclusive and effective way. Meaningful, participatory engagement of assistive technology users will help governments and service providers to understand the unique needs of these individuals and ensure the development of inclusive, effective and resilient services.(Desmond et al. 2018)

While the inadequacies of our existing assistive technology systems, policies, and services have been highlighted by the acute and rapidly changing nature of the COVID-19 pandemic, these failures are also present and important during non-crisis times. Each of these actions, taken together, will not only address needs for more robust and resilient systems for future crises, but also the day-to-day needs of all assistive technology users. We have a responsibility as a global community, and within our respective countries, to address these inadequacies now, to ensure an inclusive future.

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