



## Equity in telemedicine for older adults during the COVID-19 pandemic

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The coronavirus disease 2019 (COVID-19) pandemic has spurred an unprecedented paradigm shift to telemedicine across healthcare fields in order to limit exposure to the virus. At the West China Hospital of Sichuan University, telemedicine has been used to perform COVID-19-related tele-education to health professionals and the general population, as well as tele-diagnosis, online treatment and internet-based drug prescription and delivery. However, many older adults could not make appointments with doctors due to difficulty using the internet-based platform. Careful attention needs to be paid by future researchers and policymakers in order to mitigate barriers older adults face when using telemedicine.

Telemedicine uses information and communication technologies to provide health services to participants in locations far from where a provider may be physically located. There are many benefits associated with telemedicine. For example, it can facilitate treatment, chronic disease management, and patient self-care, while educating people about their conditions and encouraging positive lifestyle changes,<sup>1</sup> especially for those living in remote areas and places where there is a shortage of health professionals. In addition, telemedicine can help avoid costly hospitalizations while allowing care through remote patient monitoring and incorporating family members into the treatment process.<sup>2,3</sup> As a result, uptake of telemedicine in developed and developing countries has been increasing.

The outbreak of coronavirus disease 2019 (COVID-19) has changed the world and yielded unprecedented progress in a paradigm shift to telemedicine to limit viral exposure. As companies and schools adopt work-from-home solutions, remote consultation has also become an increasingly attractive option in healthcare. Additionally, the World Health Organization (WHO) is advocating for telemedicine as a way to provide healthcare for patients in need and to reduce the risk of spreading COVID-19 caused by travel to hospitals.<sup>4</sup> In the USA, the Centers for Medicare and Medicaid Services issued an 1135 Waiver that expanded telemedicine coverage for all Medicare patients during the COVID-19 pandemic. The European Centre for Disease Prevention and Control suggested the use of telemedicine

when possible and without compromising the quality of the offered service.<sup>5</sup> Among low- and middle-income countries, telemedicine services were implemented or broadened during the COVID-19 pandemic. The Ministry of Health and Family Welfare of India issued national telemedicine practice guidelines in March 2020, which instructed patients with chronic diseases to consult medical providers at home through telemedicine services.<sup>6</sup> The Indonesian health platform Halodoc employed or contracted with a team of clinicians dedicated to telemedicine to provide consultations for healthcare workers in the community or patients at home.<sup>7</sup> In addition, the Taguig City government of the Philippines developed a telemedicine system for both suspected COVID-19 and non-COVID-19 patients with chronic disease.<sup>8</sup> In China, immediately after the outbreak of COVID-19, many hospitals initiated tele-education, tele-diagnosis and tele-consultation, as well as internet-based drug prescription and delivery. Telemedicine played an important role during this pandemic, however, the question is, are older adults who need healthcare the most well prepared for this rapid change?

In the USA, about one-third of adults  $\geq 65$  y of age did not use internet in 2016. Of those who did use the internet, nearly half said they need someone else's help to set up or use a new digital device. In Switzerland, about 40% of those 60–69 y of age did not use the internet in 2014. Among older individuals in the UK (age  $\geq 75$  y), 57% had never used the Internet in 2016.<sup>9</sup> Further, in some emerging economies, including South Africa, Brazil, the

Philippines, Indonesia and India, the proportion of smartphone ownership among people  $\geq 50$  y of age was 35%, 32%, 27%, 13% and 8%, respectively.<sup>10</sup> In China, about 83% of people  $\geq 60$  y of age did not use Internet in 2018 and about 83.74% of older adults did not use a smartphone.<sup>11</sup> Among those who do use the internet, the majority use it for entertainment. Zhao et al.<sup>12</sup> compared the utilization of an online medical platform (*Chun Yu Yi Sheng*) between older and younger adults. In 2017, *Chun Yu Yi Sheng* provided 330 000 consultations every day. Based on an analysis of 984 337 cases, people  $\geq 60$  y of age accounted for only 1.98% (19 464) of those cases. Studies show that the reasons for unreadiness to use the internet include having no internet-enabled devices, having no smartphone and a lack of ability due to internet illiteracy or physical disability (e.g. hearing or visual impairment, cognitive impairment, difficulty in communicating, etc).<sup>9,13</sup> However, the pandemic has changed the way health systems work and we are worried that older adults are less prepared for this change.

West China Hospital of Sichuan University is one of the leading hospitals in China, providing 6 479 939 outpatient services in 2019. On average, the proportion of older adults seeking outpatient services in 2019 was 24.06% (1 559 024). In the first month of the COVID-19 outbreak, the number of outpatients decreased by 69.99% (333 874 of 477 002) and the number of older patients  $\geq 60$  y of age decreased by 64.64% (71 963 of 111 334) compared with the same period in 2019. Our hospital activated its telemedicine network immediately after the outbreak of COVID-19 in January 2020 to reduce the risk of cross-infection. Experts provided many services through this network, including COVID-19-related tele-education to health professionals and the general population, tele-diagnosis, online treatment and internet-based drug prescription and delivery.<sup>14</sup> Patients could get access to online medical services via an application called *Hua Yi Tong*. However, at our practices, we noticed that many older adults could not make appointments with doctors due to difficulty using the internet-based platform. Even though we provided online services for chronic disease management and internet-based drug prescription and delivery, many older adults could not use them because of limited digital literacy and limited access to internet. Taking our hospital as an example, near the beginning of the pandemic (25 January–7 February 2020), 3986 patients had received prescriptions or medicines through internet-based services, of which 123 were older adults, accounting for only 3.09%. During April–September 2020, this proportion increased to 15.43% (35 111 of 227 500), indicating that older adults were adapting to telemedicine. However, this proportion was still much lower than the proportion of older adults who sought outpatient services (23.93%). The disparity in the number of older adults utilizing telemedicine venues further highlights the need for improvement in healthcare access. This ‘bottleneck’ will only increase if nothing is done to address the concerns mentioned above.

Many countries are rapidly adopting measures that involve telemedicine, underscoring its necessity in facilitating social distancing goals during the COVID-19 pandemic. We believe an increase in telemedicine access could profoundly benefit patients during the pandemic and may even become a permanent way to offer medical services in the future. However, society needs to avoid causing treatment disparities for vulnerable adults  $\geq 60$  y of age. On the whole, they are more likely to need healthcare

compared with other age groups and yet they are the most likely to lose access to healthcare during the current shift to telemedicine. Therefore it is important for policymakers and other stakeholders to be aware of potential barriers in promoting telemedicine among older adults, including financial barriers related to accessibility of digital devices and the internet, heterogeneity in digital literacy and the acceptability of telemedicine among older adults due to a wider range of educational backgrounds and cognitive impairment and disability involving hearing loss and vision loss that can affect older adults’ ability to use telemedicine. Trying to close the gaps of telemedicine utilization among older adults is critical.

Fortunately, some digital literacy programs have been shown to be effective and have a long-term benefit in improving the digital skills of older adults.<sup>15,16</sup> What’s more, programs and applications developed specifically for the elderly can enhance their confidence and interest in using technology.<sup>17</sup> Most notably in November 2020, the Report on Digital Health Implementation Approach to Pandemic Management, the first G20 report regarding digital health, was announced at the G20 Summit.<sup>18</sup> This report provides a quick overview of digital health emergency response and puts forward action and implementation suggestions. Included in this report are suggestions to solve issues relating to the usability and availability of digital health for some special populations, such as older adults and people without a smartphone or other application-enabled device. Several suggestions resulting from policy work from different countries are presented below. For example, the United States Agency for International Development pointed out that when designing digital information, the rates of literacy, phone ownership and access to power among intended audiences should be considered; hybrid communication approaches (e.g. digital in combination with print, radio, television) should be used; and ensuring that digital approaches or programs can work in both online and offline environments is also important. The TraceTogether token, a physical device for national digital contact tracing in Singapore, was devised to be usable regardless of internet connectivity, which offered a possible solution to overcome issues with access. Italy and Poland both mentioned that special attention was given to seniors who lack confidence in using technology-based tools. Of course, telemedicine is a fundamental element in digital health, and these suggestions were suitable for promoting telemedicine use in older adults. What is gratifying is that some countries have realized the vulnerable position of the elderly in using telemedicine and are making efforts to solve these problems.

Overall, when considering a plan to boost technological utilization among older adults, it is crucial to consider both physical and circumstantial barriers to implementation. To advance telemedicine, researchers and policymakers should work together to study effective strategies and implement policies to mitigate barriers. Only then can society better close this gap in the ever-important realm of telemedicine.

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## References

- 1 Qiang CZ, Yamamichi M, Hausman V, et al. Mobile applications for the health sector. Washington, DC: World Bank Group; 2012. Available from: <http://documents.worldbank.org/curated/en/751411468157784302/Mobile-applications-for-the-health-sector> [accessed 5 May 2021].
- 2 World Health Organization. mHealth: new horizons for health through mobile technologies. Available from: <https://apps.who.int/iris/handle/10665/44607> [accessed 5 May 2021].
- 3 Kim T, Zuckerman JE. Realizing the potential of telemedicine in global health. *J Glob Health*. 2019;9(2):020307.
- 4 The Medical Futurist. COVID-19 and the rise of Telemedicine. 2020. Available from: <https://medicalfuturist.com/covid-19-was-needed-for-telemedicine-to-finally-go-mainstream/> [accessed 4 May 2021].
- 5 European Centre for Disease Prevention and Control. COVID-19 infection prevention and control for primary care, including general practitioner practices, dental clinics and pharmacy settings: first update. Stockholm: European Centre for Disease Prevention and Control; 2020. Available from: <https://www.ecdc.europa.eu/en/publications-data/covid-19-infection-prevention-and-control-primary-care#no-link> [accessed 4 May 2021].
- 6 Ministry of Health and Family Welfare, Government of India. Telemedicine practice guidelines. 2020. Available from: <https://www.mohfw.gov.in/pdf/Telemedicine.pdf> [accessed 13 August 2021].
- 7 Djalante R, Lassa J, Setiamarga D, et al. Review and analysis of current responses to COVID-19 in Indonesia: period of January to March 2020. *Prog Disast Sci*. 2020;6:100091.
- 8 Caliwan CL. Taguig launches ‘telemedicine’ program amid Covid-19. Available from: <https://www.pna.gov.ph/articles/1098024> [accessed 13 August 2021].
- 9 Hargittai E, Piper AM, Morris MR. From internet access to internet skills: digital inequality among older adults. *Univ Access Inf Soc*. 2019;18:881–90.
- 10 Laura S. Smartphone ownership is growing rapidly around the world, but not always equally. Available from: <https://www.pewresearch.org/global/2019/02/05/smartphone-ownership-is-growing-rapidly-around-the-world-but-not-always-equally/> [accessed 13 August 2021].
- 11 Jin YA, Zhao MH. Internet use and the elderly’s active aging in China: a study based on 2016 China longitudinal aging social survey. *Popul J*. 2019;41(6):44–55.
- 12 Zhao Y, Li J, Zhou L, et al. A comparative analysis on the needs and satisfaction of elderly and non-elderly users of online medical platform—a case study of Chun Yu Yi Sheng. *China J Inform Syst*. 2018;21(2):67–80.
- 13 Lam K, Lu AD, Shi Y, et al. Assessing telemedicine unreadiness among older adults in the United States during the COVID-19 pandemic. *JAMA Intern Med*. 2020;180(10):1389–91.
- 14 Hong Z, Li N, Li D, et al. Telemedicine during the COVID-19 pandemic: experiences from western China. *J Med Internet Res*. 2020;22(5):e19577.
- 15 Miwa M, Nishina E, Kurosu M, et al. Changing patterns of perceived ICT skill levels of elderly learners in a digital literacy training course. *Libres*. 2017;27(1):13–25.
- 16 Xie B, Charness N, Fingerman K, et al. When going digital becomes a necessity: ensuring older adults’ needs for information, services, and social inclusion during COVID-19. *J Aging Soc Policy*. 2020;32(4–5):460–70.
- 17 Castilla D, Botella C, Miralles I, et al. Teaching digital literacy skills to the elderly using a social network with linear navigation: a case study in a rural area. *Int J Hum Comput Stud*. 2018;118:24–37.
- 18 World Health Organization. G20 first-time released report on digital health interventions for pandemic management. Available from: <https://www.who.int/news/item/07-12-2020-g20-first-time-released-report-on-digital-health-interventions-for-pandemic-management> [accessed 27 July 2021].