Title: Medicine in the age of COVID-19: considerations for the ongoing use and development of telehealth

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Medicine in the age of COVID-19: considerations for the ongoing use and development of telehealth

Coronavirus disease 2019 (COVID-19) has been the source of mass disruptions to healthcare systems globally. The virus, however, has prompted a time of unprecedented medical innovation. Telehealth, a means of delivering healthcare via telecommunication technologies, is one medical technology that has undergone expeditious development in recent months. Of note, telehealth is not a new technology – Australia has previously utilised telehealth during national emergencies, including severe droughts and bushfires, albeit with limited uptake and therefore, limited impact [1]. Social distancing laws during the coronavirus pandemic however, have necessitated the rapid adoption of telehealth as a pragmatic solution to maintaining public health during COVID-19.

Telehealth services have been crucial during the COVID-19 pandemic, enabling screening and treatment of both infected individuals and non-infected vulnerable populations. China, the initial epicentre of the virus, led the way with telehealth development. Several large telecommunication providers rapidly adapted to enable remote health consultations while health insurance providers modified policies to enable reimbursement of telehealth consultations [2,3]. In response to China’s success, many other countries have followed suit. Over 50 health systems in the United States have designed programs that enable virtual screening of high-risk patients [4]. Scotland has similarly promoted the development of telehealth, with a £9.24 million investment to support the implementation of video consultations for general practitioners [5]. Australia has also rapidly updated its telehealth services; video consultations that were previously only accessible to individuals in remote settings are now commonplace in many outpatient clinics [3,5].

Notably, telehealth has shown promise as an effective method of healthcare delivery in prisons [6,7], during war [8], in low-income countries [9], and during pandemics [10]. There is evidence of benefits for Australian rural communities in particular, including reduced costs, improved access to healthcare for rural patients, and improved access to professional development for rural clinicians [11]. There is also some evidence to suggest that telehealth may be an effective method of healthcare delivery for patients with chronic diseases including chronic obstructive pulmonary disease (COPD) [12], chronic heart failure [13] and lower back pain [14]. This may be attributed to the fact that the frequent reviews which play a core role in long-term chronic disease management can easily be substituted by videoconference consultations, particularly for patients with stable disease. There is additional evidence for efficacy in patients with mental illness, specifically in improving medication adherence and reducing symptom severity [15].

In spite of this, there is a lack of high-quality evidence surrounding the cost-effectiveness of telehealth. Trials assessing telehealth are often poor quality and typically lack solid economic analysis [12-15]. High quality trials that do provide economic analyses tend to report poor cost-effectiveness. Dixon et al. reports that whilst telehealth provided a small positive benefit for patients with depression, the cost of the intervention was high relative to the small gain in quality-adjusted life years [16]. Conversely, Clarke et al. demonstrates cost-effectiveness of an intervention targeting patients with COPD but reports that the variability of savings between intervention groups was too great to produce statistical significance [17]. The study highlights perhaps the single greatest difficulty in determining cost-effectiveness of telehealth technology itself.
Several logistical barriers to telehealth also exist. For example, 14% of Australians lack internet access, with rural and elderly populations being disproportionately affected [18]. Concerningly, these two demographics stand to benefit the most from ongoing telehealth services. A lack of internet technology skills, particularly in older patients and clinicians, adds difficulty to navigating telehealth services [19]. Both patients and physicians have raised additional concerns regarding establishing a provider-patient relationship and the incompleteness of physical examinations [20,21]. Finally, privacy concerns are widespread, particularly in the context of the rapid adoption of systems that may not have been adequately tested [22,23].

The undeniably challenging environment of COVID-19 has called for the rapid development of telehealth. There is a paucity of high-quality evidence supporting telehealth however, with existing research rarely providing conclusive data, further large-scale clinical trials with robust economic data is necessary. Accessibility must be addressed, particularly for rural and elderly patients. Education for both medical students and clinicians is similarly vital to ensure proficiency in telehealth use amongst healthcare workers. There must also be rigorous testing of telehealth infrastructure, not only to address security concerns, but also to ensure usability of the service. Telehealth undoubtedly shows promise as an effective healthcare delivery system but will require evolution from its current form before it can establish itself in the modern medical landscape.
Conflict of interest
The authors declare that they have no competing interests.

Authors contribution
JM and HM contributed to the conception and design of the manuscript, prepared the manuscript and contributed to manuscript editing and review. JM and HM both approved the final manuscript.

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