Editorial: Special issue on "The Primary Care Informatics response to COVID-19"

ARTICLE INFO

The SARS-CoV-2 pandemic (COVID-19) has emphasized the importance of a robust digital heath ecosystem to deliver safe, efficient, equitable care for everyone who needs it. Primary care was impacted greatly by COVID-19 due to the need to move to virtual care delivery to accommodate public health restrictions. Primary care, like all of medicine, is part of a learning health system and we need to examine, monitor and evaluate the primary care informatics (PCI) response to COVID-19.

This special issue received a broad range of submissions – historical documentation, reviews, research and education – from low, middle and high resource countries across the globe. The range of topics addressed included telehealth, teledentistry, telemonitoring, mobile health, population surveillance, social media analysis for early warning, diagnostics, predictive modelling, machine learning, deep learning, EMR, and education. Seven papers met the criteria for publication in the IJMI. They represent a range of PCI responses and challenges over the short and long term.

A review paper, using Australia as a case study, found that telehealth was the key PCI response in primary care, together with mobile applications and national hotlines, to enable the delivery of virtual primary care and support public health [1]. Enablers and barriers such as workforce training, digital resources, patient experience and ethical issues, and business model and management issues were identified as important in the evolution of virtual primary care. These findings complement the description of Australia's COVID-19 response that emphasised a primary care approach, changes to telehealth and virtual care models and the widespread mobilisation and use of data to inform the changes [2,3]. A primary care data warehouse project de-identified, encrypted, extracted, cleaned and analysed data from c. 1300 general practices daily. The curated dataset was analysed to address areas of concern of stakeholders such as GPs, Primary Health Networks, Local Health Districts and government. One analytic solution linked and used multiple data elements - pathology orders, SARS-COVID-2 related diagnoses, COVID-19 related concerns (via NLP of progress notes) from general practices and confirmed case figures from state governments – to rank geographic areas by the likelihood of a COVID-19 outbreak. This PCI data linkage project demonstrated the importance of well-designed information systems, accurate and reliable data and a good understanding of GP data to enable effective real-time community monitoring in rapidly evolving public health emergencies [3].

The risks associated with the rapid development, repurposing and/or redeployment of existing digital health systems and apps in the COVID-19 response could be categorised into five risk areas: governance, system design and coordination, information access, service provision, and user (professional and public) reception [4]. Underlying all these risks is the perception of and trust in the digital health developments and quality monitoring in the overall integrated primary care information and services ecosystem.

The prevailing digital health maturity of the system or country is an important consideration [5]. More than half of patients reported in an online survey that they did not have a good experience with a customised "store-and-forward voice and text messaging teleconsultation service" in a low-income and low-resource country [6]. On the other hand, a qualitative study explored the utility and usability of a COVID-19 symptom monitoring system (CoSMoS) with patients and doctors in a middle-income country and found more positive experiences, with doctors preferring to integrate CoSMoS into the electronic medical record [7]. This also reflects the importance of a careful choice of digital health and PCI interventions, implementation strategies and evaluation methodologies [8].

Health & medical education responded similarly with virtual and online innovations. A USA medical education group developed, deployed and evaluated a virtual critical care curriculum utilizing telemedicine and electronic health record (EHR) technologies [9]. Participating medical students specifically noted strengths of the "student focus" and the ability to practice in an EHR copy rated the "student focus" and the ability to practice in an EHR copy highly, while lower rated areas included "perform minor procedures", "patient counselling", and "interprofessional experiences". Virtual training must complement in-person training to produce digitally mature primary care health professionals to deal with future epidemics/pandemics.

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1. Conclusions

COVID-19 has transformed primary care, education and training with the rapid adaptation of digital technologies to complement "in-person" primary care with telehealth and virtual models of care and education. Challenges with PCI innovations during COVID-19 were identified and included digital health literacy, maturity and readiness, along with micro, meso and macro-organisational barriers over the short and long term. Rapid PCI responses must use health system thinking to overcome challenges related to the long-term development of digital health ecosystems, and interoperability of health IT infrastructure, with concomitant weaknesses in existing and future evaluation and quality improvement programs. These identified risks can guide the directions for next-generation PCI development, quality improvement and evaluation required to better prepare for the post-COVID-19 era, future epidemics, or other unforeseen global health emergencies. An updated evidence-based approach to health informatics implementation and governance is essential to gain public confidence in digital health across primary and other health sectors. Existing information and communication technology platforms should be improved to support generic and generalisable teleconsultation solutions and enable grater interactivity to optimise patients' experience with telehealth services.

COVID-19 has exposed deficiencies in the ability of health systems to manage global pandemics. The role of the PCI community is to develop, implement and quality monitor robust PCI systems that can efficiently respond to global challenges, e.g. pandemics, across the health enterprise. To that end, there is a need for more research and education into how standards-based enterprise architecture can support data quality and interoperability to innovate with telehealth and virtual models of care to improve the access, equity, integration, safety, and quality of virtual primary care and services across micro, meso and macro systems of care delivery. The ultimate deliverables are well-designed PCI systems and well-trained people optimise the use of data and application of digital health tools to transform integrated primary care delivery and improve citizen outcomes and health professional wellbeing globally.

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