APPLYING THE DIGITAL HEALTH CONCEPTUAL FRAMEWORK INTO POPULATION HEALTH PRACTICE

To the Editor

Recently in the *Journal*, Maeder et al.,[1] described a framework for conceptualising digital health interventions during COVID-19 (the 2019 SARS-CoV-2 global pandemic). Though perhaps not the primary intent, the possibility that this may be generalisable to global pandemics or possibly even further as a conceptual framework for digital health exists. These framework dimensions and their sub-components are listed in table 1, though some modifications have been made that made sense to this author in terms of clarity of concept (these are highlighted).

Table 1. Digital Health conceptual framework.

Elements	Dimensions
1. Clinical Processes	a) Direct care b) Diagnostic c) Broader care
2. Health Systems	a) Sector b) Role c) Background
3. Stakeholders	a) Frontline workers (e.g. clinicians)* b) Administrators (including policymakers and leaders)* c) Consumers (i.e. patients, family and friends)* d) Community groups*
4. Technology	-

* These elements were modified from the original model.

Much has been made of the importance of digital health during the COVID-19 pandemic and the sea-change occurring in healthcare delivery and models of care as a result of the changes this pandemic has effectively forced on societies and healthcare providers.[2-5] From a health administration perspective it is worth considering how the framework could be used and the application within the healthcare environment, particular in order to understand gaps in capabilities, the value of rapidly acquired capabilities and the implicit impact on models of care and health pathways.

Anecdotally, COVID-19 has had what seems to be widely different effects in different environments. In areas with significant rates, clinicians appear to have been over-worked and the health system inundated. In well-controlled environments, many clinicians were not engaged in either new or usual activities.

An example worth considering in South Australia is that we piloted a patient self-registration app for individuals presenting to purpose-specific COVID clinics. Many people/groups in our state health system separately identified the need for this capability, and indeed it has started a wider conversation about the generalised need and opportunity for patients to digitally self-register their arrival at our acute and elective services, particularly as an alternative to touted physical kiosk infrastructure. Many solutions were proposed, including academic, internally developed and commercially provided solutions, using a wide variety of platform technologies. All of these essentially provided the same consumer function of enabling patients to fill out an electronic form, have that information sent electronically to administrators and clinicians and aggregated centrally for health intelligence purposes.

The clinical processes that were being facilitated were registration within the clinic and information transfer from the patient to the provider. Information from the consumer was required in order to accession them into the health information system and also to improve the efficiency with which the patient transitioned through the service. This was part of a direct care process that was primarily diagnostic with, anecdotally, most patients presenting to this COVID clinic for testing of incidental symptoms rather than because they had a significant clinical need. As with much health information, this information was also centrally aggregated for reporting purposes. Although "secondary" in nature, the purpose of screening individuals was primarily population health reasons; which loosely fits under the "broader care" dimension.

In terms of our health system context, our digital health journey in South Australia has been that we are a relatively small state of just over 2 million people with a vertically-integrated health system of relatively centralised control, with a degree of community-centred subdivision in what we call local health networks. The country has a hybrid public-private system, with most primary care being provided by private general practitioners through a part-funded centralised funding mechanism. That funding mechanism was significantly altered and expanded to enable telehealth services during COVID-19. The state itself also funds public health services in addition to the federal government. We have a few large hospitals with several rural and remote hospitals representing approximately 10% of our population. We are part-way through a several-year, phased implementation of a state-wide PAS-EMR (Patient Administration System – Electronic Medical Record) project with multiple legacy PAS systems, a few centralised health information systems (RIS-PACS, LIS, a lower-level HER and a telehealth network). We do not currently have a formal

HIE or centralised clinical data repository nor indeed a formal state-wide digital health architecture. The pilot hospital was a large metropolitan tertiary hospital with both adult, paediatric and maternity services. South Australia has not so far experienced the total number of individuals affected by SARS-CoV-2, associated morbidity and mortality than other countries have seen.

The stakeholder groups in this particular example are the patients entering the clinic, the clinicians and administrators within the clinic, and the wider COVID response teams, including local and state-response, insofar as the information is used for health intelligence. In this example, we opted to pilot an instance of an application developed elsewhere instantiated on local resources.[6,7] The underlying platform is a well-established research tool called REDCap, presented surfaced to patients in a web-based form.[8] The technology itself was neither complex nor costly, though in a large enterprise health organisation, the project management work to enable this was not insignificant.

Maeder et al. in their article cite that there are micro- and meso- frameworks for describing digital health ecosystems and contribute this new framing to help conceptualise interventions at the macro (but perhaps not "meta") level. Reflecting on this current exercise, it is worth considering some differences between this and how we planned the clinical and organisational need for such a capability. Firstly, as clinicians working in digital health, we grounded ourselves in what the clinical, patient or administrative need was that we were trying to solve. Secondly, we linked this need with the operational requirements of the provider organisation and the wider health information system, including health intelligence requirements. We undertook additional tasks which related to obtaining organisational sponsorship, implementation planning and evaluation which do not necessarily relate to this framework but since the implementation is such a well-recognised challenge, is potentially worth considering in such a framework.

Consequently, our consideration of clinical and administrative processes was therefore explicit. The consideration of our health system was sub-conscious and implicit, though making it explicit may have helped with planning. We did not actively seek consumer input due to the timing and difficulty of doing so, but the need had been escalated from frontline clinical and administrative works. While we used technology and did consider the underlying technology advantages and disadvantages we did not focus on the technology layers due to the relative commodity of the underlying platform capability. Unfortunately, as we did not undertake such a technology scan, we did not leverage other capabilities in the wider organisation.

In reflecting on the framework in the context of our experience with this pilot digital health intervention, there are a few considerations. In the public-health context, organisations provide healthcare with people planning and effecting care. Therefore though clinical processes are critical, they are processes in a wider system of planning care, executing care, funding/ planning/ commissioning provider services, and reporting quality/ operational/ activity/ financial and broader health outcomes. In our experience, there was less focus on technology and more focus on enablement. Being mindful of the health system is critical particularly for translating technologies and workflows from one hospital, state or country to another and our own experience with implementing systems has caught us out in this respect in terms of translating billing systems.

This reflective exercise identifies that there are potentially differing interests or framing of digital health interventions depending on whom the assessor of the project is, and therefore from an epistemological perspective expansion into a meta-framework could potentially extend the translatability and application of this framework.

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