



Research Platform 01

Digital health and clinical informatics

Defining digital health and clinical informatics

Data is transforming the way we understand health care. Digital health and clinical informatics represent the integration of digital technologies into all levels of health research and the provision of health care, from understanding the causes of disease and streamlining the way doctors and hospitals work, through to incorporating genomics and big data into our understanding of health and disease.

The shift from paper to digital will improve the health of Victorians and will achieve substantial cost savings and potentially attract more profitable clinical trials to Victoria.

Health and medicine are currently undergoing a digital revolution. Electronic Medical Records (EMRs) are bringing hospitals into the twenty-first century globally, genome sequencing is producing vast amounts of data that is revealing the very blueprint for life and clinical informatics is drawing insights from multiple layers of data to help improve health and lower health care costs.

My Health Record, an online personal summary of health information as described in Australia's National Digital Health strategy, is being rolled out nationally. The goal is that by 2018, every Australian will have a My Health Record, unless they opt out, and by 2022 the record will be accessible throughout the entire health care system, from GPs and specialists through to hospitals and pathology labs. While the information in a My Health Record will be useful for patient care, the data it stores is only a basic summary of each care episode and can be selectively disclosed by patients. As such it cannot be used effectively for research purposes.

Hospital EMRs store a wider range of granular data information that are fit for purpose when it comes to research. The research applications are further enhanced when EMRs link with other EMRs, primary care and community care information and remote monitoring devices through a population health research layer. This layer interfaces with other layers of data, such as social health information and other government databases yielding new insights into the causes of disease and helping to promote preventative approaches that could improve millions of lives and save billions of dollars globally.

There are also tremendous opportunities to gain deeper insights into health that will guide preventative strategies and optimise the response to disease, potentially saving millions of lives and billions of dollars. This will require a concerted effort to improve the way we analyse data, as well as new and innovative applications to make the best use of data (e.g. the personalisation of medicine).

The Generation Victoria project is a vivid example of the power of health informatics techniques. Generation Victoria is gathering multiple different types of information on hundreds of Victorian children from before birth through to later in life. By sifting through this data, researchers have already found they can identify which children at the age of four years are at high risk of disease later in life. With this information, they can suggest preventative measures

to keep these individuals healthy and drastically reduce the burden on the health care system in future.

Digital health will also extend to incorporate mobile technologies, telehealth, bioinformatics and population health, and is expected to spark a multi-billion dollar industry rivalling medical devices within the next decade. One example of a product in development in the Melbourne Biomedical Precinct is Phoria, a virtual reality experience for children to use in hospital to improve wellbeing during long periods of illness. Another is SkinView, which has developed a clinical device that clips onto a smartphone that allows people to quickly and easily check any suspicious skin lesions for signs of melanoma. There are also digital devices in development that aid the monitoring of adolescent mental health, building on the Melbourne Biomedical Precinct's mental health strengths.



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Current strengths and opportunities

Comprehensive digitised health records

The Royal Children's Hospital has already made a pioneering step within Australia by implementing a world-class EMR and quickly raising it to a high-quality level. This means Precinct Partners already have experience with the benefits and challenges of using an EMR.

Graduate programs

The University of Melbourne has established the Clinical Informatics and Digital Health graduate course within the Melbourne School of Population and Global Health to train the next generation of people working in the health sector in health informatics.

Research and linking information

Melbourne Biomedical Precinct researchers have expertise in drawing insights from anonymous medical information from large groups of patients. In the short term, the Precinct needs to better utilise its existing capabilities in digital health to encourage innovation. When integrated with other data, such as My Health Record, age, births, deaths, marriages, education and income, health informaticians can discover patterns that can help them predict and prevent disease.

Information governance

Governance is an important consideration for the integration of EMRs with other data sets.

Future opportunities

Leading the nation on clinical health information

A major challenge and opportunity will be to make the most of the vast amounts of data that will be generated. The Melbourne Biomedical Precinct will need to build on its clinical and health informatics expertise to drive the integration and analysis of these various streams of data.

Digital innovation test bed

Digital health represents a huge opportunity for new medical technology businesses and partnerships with industry. Building an entrepreneurial culture through networks and courses will help grow the broader digital health sector.