

Health care's technology revolution means a boost for jobs in IT

August 7 2015, by David Hansen



Eye testing in remote areas of Australia with the images stored and set via satellite to city-based specialists. Credit: CSIRO, CC BY-NC

We tend to think about our health care sector as a leader in the development and use of advanced medical technology and biotechnology, such as expensive imaging machines or devices that we implant into patients.

But in many aspects of conducting the business of [health care](#), our health

care system is still in a pre-digital era. For example, health care may be the last sector where significant amounts of communication are still done via fax and regular post.

This is not to say that significant changes are not happening. Radiology is increasingly using digital technology but the interpretation of these images is still manual. Electronic health and medical records are also being introduced widely but there is little communication between collectors.

The digital revolution in health care that is currently slowly unfolding will use data and technology to improve the health care of patients. It will also increase safety and quality, and improve efficiency in the health care system.

The eyes have it... remotely

One example of how technology can be used to deliver better health care is a recent trial by [CSIRO and our partners](#) that provided screening for eye diseases among people in remote parts of Western Australia and Queensland.

Using the nbn's satellite broadband service, we screened more than 1,200 people in their communities for diseases such as [diabetic retinopathy](#). This disease often causes irreversible blindness, and it affects the Indigenous population at nearly four times the rate of the non-Indigenous population.

Local health workers were trained at capturing high-resolution images of a patient's retina with a low-cost retinal camera. These images were stored then uploaded over the NBN satellite to ophthalmologists in Brisbane and Perth.

The screening program identified 68 patients who were at high risk of going blind, including those with [macular edema](#). In the most case these patients received treatment locally. However, some patients needed transfer to major hospitals for immediate treatment.



Captured: a typical high-resolution image of a patient's retina. Credit: CSIRO, CC BY-NC

Once patients were identified as being at risk of significant eye disease, they were provided with care plans that involved local follow up consultations and regular screening the tele-eye care screening program.

For diabetic patients this included advice on controlling their diabetes, which improves their overall health as well as reducing the risk of blindness.

We have the technology

Overall, the trial showed the effectiveness of providing a "store and forward" tele-ophthalmology service using satellite broadband. These types of services have previously been held back by unreliable broadband services and the lack of digital systems in our [health services](#) to interact with them.

Reliable broadband connectivity together with increased use of digital systems by health services means that these methods of health service delivery can now become the normal way health care is provided.

But for these tele-enabled models of care to really take off, patient data must be shared between providers. At the moment, different health care providers – GPs, specialist doctors and emergency departments at local hospitals – all separately collect information about the same patients.

This means that the services that a patient receives are generally uncoordinated. With the increase in chronic diseases, such as diabetes and eye-disease, coordinated care will lead to better health outcomes.

For providers to share data requires their computer systems to be able to send and receive data, and make sure that the data is added to the correct patient's electronic record.

This is where the type of algorithms that power search engines such as Google – [semantic web](#) and information retrieval technologies – can be tailored for health care systems. Shared properly, the data can be used to make sure that patients receive appropriate services.

Sharing this data will also mean that there is a bigger volume of data about a patient with each [health care provider](#). This will require computers to do more to analyse the data and alert patients, clinicians and health care providers when there should be follow up action.

More IT jobs needed in health care

The increase in the use of digital technologies will not only boost health care. This is a sector where there will be a significant boost in the number of IT professionals, including data scientists, needed to work.

Big data analytics will be required to analyse the large volumes of different types of data that are being collected at an increasing rate.

But it is not just about applying these new technologies in health care. There is also a need to work with clinicians and health service executives to understand what data is – or could be – collected. This may lead to a new way of providing clinical care, a new health service, or even make existing processes more efficient.

For [data](#) analysts and IT professionals working in health care, the opportunities to make a difference to [patients](#) are almost boundless.

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