

Occasional Address: Graduation Ceremony for the University of SA Schools of Health Sciences, Nursing & Midwifery and Pharmacy & Medical Sciences

Australia's Healthcare System in 2020: What will it look like and what will it mean to today's graduates?

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This is indeed an exciting time to be graduating in the field of Health Sciences. So I would like to take this opportunity to paint for you my expectations of what your sector will look like in 2020, and what that might mean for your future career.

You are entering a world of healthcare that already looks very different from the one I graduated into, and it will continue to change dramatically over the next two decades.

This is being driven by changes in demographics, economic and technological changes:

- The population is growing and ageing – more than 9% of the global population will be over 65 years in 2020 compared with about 7% in 2005.
- Lifestyle changes have and will continue to introduce new health challenges, such as obesity and diabetes, while infectious diseases are much more likely to spread globally – witness the recent avian flu scare.
- Diseases of the developing world will be increasingly like those in our country. For example, the number of people in India with diabetes is expected to exceed 70 million in 2025, and will cost India over \$30 billion per annum at today's costs.
- The 1990s were widely considered to be the decade of the IT revolution. The current decade is likely to belong to biotechnology. Just think back to the first sequencing of the human genome less than a decade ago. At the time this was a very ambitious, 13-year task. In 2007, laboratories take only a few days to achieve the same thing because of such rapid advances in DNA sequencing technologies.

This and other breakthroughs in biotechnology will affect every aspect of the way we live and how we diagnose and treat illness. By 2020, we will have a huge range of new treatments and disease management options that are only dreams at present. But the new medicines and treatments will also be more expensive.

It is obvious that if we do not respond to these trends, most countries, including Australia, face an enormous and unsustainable blow-out in direct health and aged care costs as well as indirect welfare payments. It has been predicted that under the current scenario, the combined costs of health and residential aged care will more than double over the next 40 years to reach a massive 10% of Australia's GDP.

So what will the healthcare sector look like in 2020 assuming we rise to this challenge?

1. There will be a much greater emphasis on primary (community) patient care

There are several reasons for this. Firstly, medical advances will mean that many diseases that are currently terminal will be reduced to preventable or chronic manageable conditions – as is already happening with AIDS. These advances will allow community-based medicine to undertake much more complex diagnostics and treatments than at present must be delivered by hospitals.

But the strongest driving force is likely to be the looming blow-out in costs of hospital care. It is recognized that even now too much of our healthcare is undertaken in the hospital setting, but little is being done to address the problem. Change will be inevitable, however, as we face the unsustainable prospect of spending 10% of GDP on healthcare. The solution is to shift the balance towards community-based medicine for many illnesses that are currently dealt with in hospitals, restricting hospitals to emergency, intensive care and major surgery.

2. The self-medication sector will also grow because people are increasingly interested in taking responsibility for their own health

Already many patients use alternative medicines – up to 80% of cancer patients, for example. These include 'complementary medicines' such as traditional herbal remedies, and 'nutraceuticals' - foods that have a health benefit above and beyond their nutritional value). As an example, the Nutritional Physiology Research Centre in the UniSA School of Health Sciences is at the forefront in demonstrating positive effects of omega-3 fats on cardiovascular, metabolic and mental health.

As alternative medicines become regulated more stringently in terms of demonstrating efficacy, they will gain broader acceptance as low-cost alternatives to prescription drugs. Even in mainstream medicine, the self-medication sector will grow as more and more drugs become available as OTC products.

The internet is a significant source of information for patients. Web-based self-diagnostics will continue to grow, and we will see the emergence of 'Wellness Services' aimed at diagnosing and preventing future health problems.

3. Emphasis on prevention and better monitoring

By 2020, wearable or implanted devices will monitor patients wherever they are – such as blood lipid levels in a patient with high cholesterol. The data will be transmitted to a wellness centre or medical service where it will be interpreted and if necessary, the patient will be automatically contacted via an automated voice message on their mobile.

We will also have many more tools, such as vaccines, to prevent rather than treat disease. The cost savings can be enormous. Just for Alzheimer's disease alone, a recent US study calculated current total costs to American business at US\$61 billion a year in caregiver time, productivity loss and medical expenses. On a comparative population basis, this means that Australian business is losing approximately \$4 billion per annum due to Alzheimer's alone.

4. We are entering the era of personalised medicine

The problem with current drugs is that they do not work for all patients. Your genetic background may mean that you simply do not respond well to a drug that has amazing benefit to someone else with the same condition. Alternatively, you may not take the drugs properly because you find the cure is worse than the disease. Apart from poor quality of life, the impact of non-compliance on healthcare costs is horrendous – estimated to exceed \$77 billion per year in the USA alone.

In 2020, each of us will probably all have our genomes sequenced – and at a cost of less than \$1000! This will mean that we will know in advance our genetic disposition to all major diseases and our likely responsiveness to recommended drugs.

The economic and health benefits will be considerable. But it will also raise a raft of ethical and legal considerations. Who owns our genetic information? Will insurance companies demand to know you genetic predispositions before insuring you? And what will be the impact on your health insurance costs?

5. Developments at the interface between technologies will be critical

Developments in biotechnology alone will not be sufficient to achieve this vision for 2020. Innovations in information technology, nanotechnology and social sciences will be just as important. For example, the continuous monitoring of patients mentioned earlier will be require the development of nanotechnology-based implantable devices as well as the integration of complex IT solutions into the healthcare system.

R&D that is at the interface of these various disciplines will provide the most important technological breakthroughs of the next decade.

4. Science education will assume even more importance

There are already serious concerns with the quality of science teaching in our schools. If we are to meet the vision for 2020, we will need to train many more healthcare professionals, as well as provide the general public with a much deeper and broader understanding of health issues.

I would propose that in addition to a ramp-up in teaching for careers in the healthcare industry, a 'Science-for-Life' topic should become an essential component of the high school curriculum. This would be targeted at providing the general public with the level of understanding necessary to make informed decisions and choices from a potentially bewildering array of healthcare options in 2020.

What will this vision mean for the career opportunities of today's graduates in the healthcare sector?

You are poised to benefit from exciting times! The expansion of community based medicine will mean that nurses will increasingly take responsibility for basic diagnostics and prescribing in a new role as 'nurse-practitioner'. Pharmacists will take on a broader role through growth of the self-medication market and the growth in complementary medicines. Occupation health graduates will enjoy more diverse and increased opportunities as we find ways to allow the ageing population to live at home for longer.

Healthcare graduates will also see expanded opportunities in the areas of health care policy, ethics and legal professions. Those with double degrees in healthcare and one of these other areas will be particularly in demand. The rise of ‘Wellness Services’ will also offer a diverse range of career opportunities.

The need for additional academic and industry researchers spanning biotechnology, IT and nanotechnology will grow to meet the demands for new drugs, medical devices and healthcare service, driven in part by the expansion and maturation of Australia’s young biotechnology industry. This will be accompanied by growth of job opportunities in the investment capital sector as biotechnology becomes a more mainstream investment option in Australia.

Perhaps most excitingly, the job many of you will hold in 2020 probably does not exist today. This was certainly the case when I completed my PhD in biochemistry in 1980. I could not anticipate a position as CEO of a biotechnology company when the industry did not even exist!

My closing advice to today’s graduates is to keep an open mind about your future career directions. Your degree can open many more doors than you might imagine.

As Yogi Berra famously quoted: “when you come to a fork in the road... take it”!