

Advanced technological solutions for a healthy Australia

The Academy calls for the development and deployment of advanced technological solutions for a healthy Australia.

Healthcare must be effective and affordable. To deal with changing demographics and patterns of disease, Australia must develop and deploy advanced technologies that are effective across all populations, including the aged and people with disability. Technologies can play a major role in reducing healthcare costs when they are socially accepted and widely adopted. Such technologies can also enhance Australia's economy if they are developed from a strong Australian industry base which draws on world-class research and development.

World demographic change

The world is undergoing unprecedented demographic change. In 2014, the global population was 7.2 billion, with United Nations projections that it will reach 9.6 billion by 2050. This growth will place greater demand on resources, infrastructure and expenditure. Further, globally, the number of those over the age of 60 is expected to double from 2013 to 2050, by which time around 21 per cent of the population will fall in this age category.

The pattern of morbidity is also changing from predominantly acute or infectious diseases to chronic disease such as many cancers, cardiovascular disease and dementias, alongside dramatic increases in the rates of obesity and diabetes. The aged population in particular often suffer from multiple chronic diseases, which pose serious long-term impacts on healthcare demand, creating an urgent need for new innovative approaches to healthcare design and delivery.

Visionary health policy is central to economic outcomes and sustainability. Much will depend, for both economic growth and health budgets, on the wellbeing of large cohorts of people as they age. If effective health innovation allows individuals to stay healthier and active for longer, labour supply can increase and future health and social support costs be contained.

Challenges for Australia's healthcare system

Australia's population was around 24 million people in 2014 and is projected to grow to around 36 million by 2050. Australia's growth will occur against the background of a continuing demographic transition from a predominantly younger population to a much larger population of those over 65 by 2050 (13 per cent for 2014 to about 22 per cent). These population changes pose significant economic implications in terms of increased healthcare expenditure, infrastructure requirements and the increased need for healthcare and aged care workers across larger cities and remote and regional Australia. The challenges for the healthcare system also present economic opportunities via Australia's new wave of medical device industries. This industry sector, if adequately supported, has enormous capacity to translate the considerable investment being made in medical research into practical end use processes and products that enhance the lives of Australians.

Australia's total spending on healthcare in 2011-12 of \$140 billion accounted for 9.5 per cent of gross domestic product (GDP), slightly above the Organisation for Economic Co-operation and Development (OECD) average of 9.3 per cent. This has grown 41 per cent from \$82 billion in 2001-02. Increases in health expenditure are contributed to a range of factors, including more people of all ages who visit the doctor more often, having more clinical tests than before and being prescribed more prescription drugs.

Increased demand for medical services and the use of new and expensive technologies has seen the proportion of GDP expended on healthcare rise, and is projected to increase to about 11 per cent by the mid-2030s. This projected increase in expenditure can provide net gains in the health and quality of life of Australians and reduced healthcare costs in the long-term, but only if it includes substantial and widely implemented health measures.

Funding for high-level residential care is projected to increase to about 2 per cent of GDP by the mid-2030s. This is largely due to increased rates of dementia in those aged over 85 years. There will be an increased need for carers at a time when the proportion of younger people is in decline. Australia's model for healthcare delivery is unsustainable and alternative ways of addressing healthcare challenges are urgently needed.

Priority focus areas

The worldwide market for medical devices is very large. The application of new technologies such as biotechnology, nanotechnology, information and communications technologies, and cognitive science is leading to the development of smarter and more effective technologies, particularly for the aged and people with disability. New technologies are also leading to the development of diagnostic tools for personalised and preventive medicine. Greater diagnostics and treatments targeted at dementia and based on the use of new and emerging technologies can reduce healthcare costs.

Major breakthroughs in the future are likely to come from collaboration between research disciplines, where clinical research will be integrated with various engineering, information communications technologies and science disciplines. Improved mechanisms for funding and performing medical-based interdisciplinary research will need to be developed.

Technology provides enormous opportunities to enhance the effectiveness of the healthcare system, such as:

- » **Genetic diagnostic testing** – to accelerate the correct diagnosis and enable preventive action
- » **‘On-the-spot’ decisions** – to reduce errors, reduce wait times and unnecessary deaths
- » **Cloud computing** – to streamline patient records, practice management and care coordination
- » **Robotics** – to assist in day-to-day operational activities and assist training in remote and regional Australia
- » **Assistive health technologies** – to enable independent living by supportive, preventive and responsive mechanisms
- » **Mobile health (mHealth) technologies** – to assist in the prevention and self-management of disease via mobile devices
- » **Electronic health (eHealth) technologies** – telehealth and telecare to deliver health services at home and in the community and facilitate off-site education
- » **Effective information communications technologies systems** – that are standardised and interoperable across States are fundamental to delivering remote healthcare services

While many countries are actively looking to new approaches to healthcare, it is important to recognise that application of smart technologies will be disruptive to current models of service delivery. The Academy aims to explore the broader aspects of the application of current and emerging health technologies and their effects on the health, social and economic wellbeing of Australians, which is necessary for widespread uptake.

The way forward

The Academy has identified priority focus areas in which world-leading research, knowledge generation and innovative technology can be applied to address our societal needs and demands into the future. From these, the Academy has identified three Health Priority Areas for action in order to advance technological solutions for a healthy Australia:

- 1. Deploy assistive technologies for the aged and people with disability to improve quality of life.**
- 2. Develop technologies for personalised and preventive healthcare.**
- 3. Grow and promote a globally competitive medical device industry in Australia.**

The Academy has further developed a series of Action Statements setting out key priorities for the development and application of health technologies which can reduce the cost of delivering healthcare services.