digital health
CRC

CHANGING HEALTH TRAJECTORIES IN CHRONIC DISEASE IN RURAL AND REMOTE SETTINGS

Vision

With mortality rates of people living in remote and very remote areas of Australia being almost 1.4 times higher than their city counterparts, this research will close the existing health divide between major cities and rural and remote Australia, by delivering research that is specifically targeted to designing culturally appropriate new models of care that can change the health trajectories of people living in rural and remote Australia, particularly those at risk of developing chronic diseases that lead to poor quality of life and reduced life span.

Innovative solutions based on Artificial Intelligence (AI) and digital technologies can enable the implementation of new personalised models of care that can be delivered across a wide geographical spread to effectively manage the risk factors that lead to unmanaged chronic disease in rural and remote settings where resources are often limited.

Digitally supported early intervention programs will enable collaboration between providers and consumers to embrace behavioural change that will result in better health outcomes and avoid unnecessary hospitalisations.

Burden of Chronic Disease in Rural and Remote Australia

In 2015-2016 the overall rate of potentially preventable hospitalisations due to chronic conditions (per 1000 population) was 11.4 in major cities as compared to 16.6 in remote areas and 23.7 in very remote areas[1]. This implies that more than 50% of hospitalisations due to chronic conditions were potentially preventable.

DHCRC flagship programs are large multi-participant collaborative research programs designed to deliver systemic impact across the health sector by focus on areas of demonstrated industry need.

Potentially Preventable Hospitalisation PPH (per 1000 population) due to chronic conditions

- Major Cities
- Inner Regional
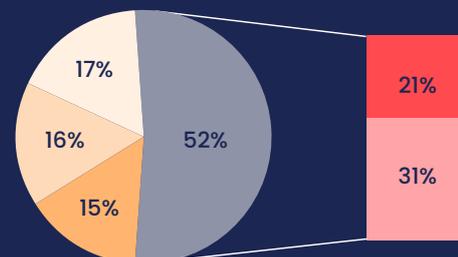- Outer Regional
- Remote
- Very Remote

Fig. 1 Potentially Preventable Hospitalisation

In addition, potentially avoidable deaths among people under age 75 also increased with remoteness, with a death rate which is over 2.5 times higher than their city counterparts.

1   https://www.aihw.gov.au/reports/rural-health/rural-remote-health/contents/rural-health.

Drivers for Change

Australians living outside major cities have significantly poorer health and lower life expectancy than their urban counterparts. Geographical variation in terms of remoteness combined with socio-economic and cultural factors have contributed to high rates of unmanaged chronic disease risk factors, such as overweight and obesity, both among adults and children.

The challenges of geographical spread, coupled with low population density have resulted in reduced access to healthcare services. As per the 2018 Australian Institute of Health & Welfare report, except for general practitioners (GPs), there is a marked decline in access to most types of healthcare professionals as remoteness increases. Limited time with GPs, coupled with limited specialists in remote areas, may contribute to more emergency departments presentations and avoidable hospitalisations[2].

Research and Innovation

Innovative technologies such as portable health check stations and/or wearables and Internet of Things (IoT) devices, will be used to design new models of care, including telehealth services. The models of care will be informed by AI-based solutions that can identify people at risk of chronic diseases for targeted, personalised preventive health programs as well as rehabilitation programs.

Understanding the risk profile will help in allocating appropriate health services, as well as in designing personalised models of care that can help trigger behaviour changes in consumers. This will eventually help to avoid unnecessary hospital admissions and empower consumers to manage their own health and well being.

Key Innovations

Design and development of automated novel enrolment program for individuals at risk

The focus here will be on intelligent analysis and synthesis of data from multiple data sources to identify people at risk who are eligible for new models of care that focus on personalised preventive services. The research will identify creative ways to capture people with unmanaged risk using data from health check stations, wearables and IoT devices.

Develop sophisticated AI-based risk stratification methods that segment populations at risk or with rising risk of unmanaged chronic disease

The risk stratification models developed as part of this research will help to identify people at risk using the full spectrum of healthcare data, spatial data and social determinants data. Understanding the risk profile for different chronic diseases based on risk stratification algorithms that categorise populations at different levels of risk, will help in designing personalised models of care for unmanaged chronic diseases for people living in rural and remote areas.

In addition to enabling personalised services, this research will reduce potentially preventable hospitalisations due to chronic conditions.

Co-design culturally appropriate programs with communities to support remote delivery of personalised healthcare using new models of care

The focus here will be to design culturally appropriate programs specifically designed for people at high risk. A key component of the design will be consumer facing dashboards that will enable providers and consumers to proactively collaborate in managing their health risks.

2   https://www.aihw.gov.au/reports-data/population-groups/rural-remote-australians/overview.