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National COVID-19 Health and Research Advisory Committee*

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Strengthening Australia’s health system post COVID-19

Topic

At the request of the Commonwealth Chief Medical Officer, the National COVID-19 Health and Research Advisory Committee (NCHRAC) considered the following topic:

There has been disruption of normal health services and prevention programs during the pandemic. In addition, there is emerging evidence of cardiovascular and other complications being more common in those who have had COVID-19. What should we be doing to re-direct or strengthen health services to prepare for what might be a substantial and prolonged increase in the chronic disease burden?

Note

This report was developed by a working group of NCHRAC, Chaired by Professor Michael Reade, with Dr Nicole Allard, and Mr Daniel Zhou. External expert advice was provided by Professors Jeffrey Braithwaite and Jennifer May.

The report is point in time and may need further review as more evidence is available.

Key Points

Issues

- The COVID-19 pandemic has disrupted healthcare service availability and attendance, which has resulted in missed or delayed diagnosis, suboptimal care and increased chronic disease burden.
- The delay in detection and or diagnosis of disease is anticipated to result in an increase in the complexity of care and burden of disease; but this will only be revealed or confirmed by long-term cohort studies.
- Cancellation of elective surgery and other secondary/tertiary care services for prolonged periods due to various effects of the pandemic has created a large backlog of patients waiting for these services.
- People with mild to moderate COVID-19 will be managed by general practitioners as per current clinical guidelines, which may impact on the focus and priority of chronic disease management.

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* NHMRC is providing secretariat and project support for the Committee, which was established to provide advice to the Commonwealth Chief Medical Officer on Australia’s health response to the COVID-19 pandemic. The Committee is not established under the NHMRC Act and does not advise the NHMRC CEO.

- General practitioners are expected to be the first point of contact for people with Long COVID.
- The prevalence of Long COVID and the extent to which it exacerbates or causes chronic disease is unknown.
- The COVID-19 pandemic has impacted the physical and psychological health and wellbeing of the Australian healthcare workforce.

Solutions

- The impact of the pandemic on access to primary care has fast tracked innovations such as electronic prescribing and use of telehealth to maintain services and care.
- Telehealth has increased access for people in rural and remote areas to a range of health services and specialties.
- Though telehealth has many benefits it should be remembered that not all health conditions and scenarios can be optimally managed by virtual healthcare workers.
- Future investment in Information Technology (IT) infrastructure that enables electronic records management systems and data sets to be interoperable as well as supports the use of home-based monitoring devices will increase coordination of health services and enhance the benefits of telehealth.
- A strong primary care system can reduce pressure on the entire health system by providing comprehensive and preventive care during and after a health crisis.
- Models of care need to be focused on health outcomes with flexible funding that supports integrated, multidisciplinary care across sectors to appropriately assess, prioritise, monitor and manage people with chronic disease.
- To address health workforce attrition, multiple strategies are required that increase workforce participation, encourage flexibility and access to support.
- Patient empowerment and improving health literacy will support making informed health choices that lead to better health outcomes.

Introduction

Globally, healthcare services have been disrupted by the reallocation of resources as well as movement restrictions and stay-at-home orders to manage and control the spread of COVID-19. Utilisation of healthcare, ranging from preventive and emergency care to chronic disease management have decreased.[1] Multiple studies revealed major reductions in visits to United States (US) emergency departments with a 42% reduction reported during April 2020, and a 26% reduction in May 2020, compared to 2019 data. In June 2020, a US survey reported that 4 in 10 adults delayed or avoided routine or emergency medical care.[2] Modelling studies estimated that delayed screening and treatment for breast and colorectal cancer could result in almost 10,000 preventable deaths in the US.[3,4] A World Health Organization (WHO) survey found disruption to healthcare services greatest in lower income countries; and there are estimates that reduction of essential maternal and child health interventions may cause more than a million additional child deaths.[5]

A systematic review examining changes to health service utilisation from February to May 2020 across 20 countries, including Australia, estimated that healthcare utilisation decreased by about a third during the pandemic.[6] Individuals with chronic disease experienced significant barriers to diagnosis, treatment and follow-up particularly if they were from lower socioeconomic settings.[7] The literature suggests that the disruption to health service delivery will have a long-lasting impact on chronic health outcomes beyond the COVID-19 pandemic.

Concurrently, the results on service utilisation indicate that there is the opportunity to prioritise and make systematic changes to healthcare systems to reduce low-value care, which can result in overtreatment and overdiagnosis.[6] On average, contemporary health system performance has be described as 60% delivered in line with either evidence-based or consensus-based guidelines, 30% of little or no value to the patient and 10% resulting in patient harm.[8] As such, while there is a need to prioritise care for those at greatest risk of adverse health outcomes, there is also the opportunity to reform the health system to ensure the delivery of services is appropriate, evidence based and of benefit to the patient. This will contribute to resolving the “60-30-10” issue and forming a health system that is dynamic and responsive to the adoption and uptake of new and emerging evidence.

For a health system to be sustainable and resilient it needs to be able to adapt to evolving demand as well as rapidly emerging threats to health. Balancing affordability with quality of care is challenged by various stressors and workforce pressures such as scarcity of financial and staff resources, public expectations, and productive working relationships between the numerous players that deliver health services. Effective systems can analyse and learn from the available clinical and research data to reduce waste and harm. A resilient and sustainable health system has an established technological infrastructure, dynamic clinical and organisational practices, a skilled and resourced workforce, empowered patients and communities, and incentives and governance structures that encourage patient-centred care.[9]

Chronic disease management

The COVID-19 pandemic has had direct and indirect effects on people with chronic disease. Mandatory isolation and movement restrictions coupled with disruption to routine healthcare services has resulted in periods of limited access to screening, treatment and review of care/rehabilitation plans. The diversion of resources and disruption to usual services due to COVID-19 has resulted in missed or delayed diagnosis, resulting in suboptimal care and increased chronic disease burden. In the United Kingdom (UK), there was an observed reduction in new diagnoses of Type 2 diabetes with higher mortality rates for people with Type 2 diabetes.[10] In the US, a large longitudinal cohort study reported a substantial increase in deaths due to cardiovascular disease and diabetes, rather than COVID-19, between March and July 2020.[11]

The impact of service disruption, coupled with the fear of contracting COVID-19 that people with chronic disease may experience, has hindered attendance at healthcare appointments especially in the intense lockdown period from March 2020 to April 2022, and in turn potentially worsened their disease control.[12] Efforts to limit the spread of infections, such as lockdowns and stay-at-home recommendations, created social and economic hardships for specific groups and negatively affected chronic disease management as well as contributed to the risk of chronic disease onset.[13]

The Australian Institute of Health and Welfare reports on 10 major chronic conditions: arthritis, asthma, back pain, cancer, cardiovascular disease, chronic obstructive pulmonary disease, diabetes, chronic kidney disease, mental health conditions and osteoporosis. Based on 2017-18 data, one in two Australians have one or more chronic conditions, and one in five have two or more of the 10 listed conditions. The rates of chronic conditions for adults are higher in lower socioeconomic areas.[14]

While Australia has not experienced the same number of COVID-19 infections and deaths as many other countries in Europe and North America, there has nevertheless been a diversion of resources to prepare and manage the emergency response. The predicted increase in the complexity of care required due to delayed treatment and/or interrupted care during the pandemic, greater burden of disease and economic cost due to lost productivity, will only be revealed by long-term cohort studies. In the interim, examination of data on access and utilisation of screening, testing and consultations is thought to be informative.

Deferred/delayed screening, diagnosis and treatment

There is qualitative and quantitative evidence that many Australians have chosen not to seek healthcare services when needed during the first year of the pandemic; however, it is unclear if appropriate health seeking behaviours have since returned.[15,16] This hinders early diagnosis and timely management of chronic disease and worsening of conditions may go unnoticed. Reasons for patient delays in seeking care include travel restrictions, a desire to minimise the risk of exposure to COVID-19, avoiding an already strained health system, barriers in accessing telehealth and healthcare provider-initiated cancellations.[17] While there is a good understanding of why health checks and treatment have been delayed during the peaks of the pandemic in Australia, it is unclear if appropriate health seeking behaviours have returned in line with the recent relaxation of restrictions. As some logistical barriers, such as travel restrictions, ease, it is important to understand how public health messaging urging avoidance of transmission continues to be understood by various population groups. Sophisticated health messaging to encourage consumers to continue seeking appropriate care during health emergencies has been suggested to help prevent indirect pandemic related health issues.[15] Moving out of the pandemic, such messaging may be appropriate to encourage the return to pre-pandemic health seeking behaviour.

Analysis of referrals for pathology testing by general practitioners (GPs) in NSW and Victoria from January 2017 to September 2020, revealed that non acute respiratory illness testing (i.e. exclusion of influenza and COVID testing) volume in 2020 decreased by 29% in NSW and 33% in Victoria. Testing volume was lower across all socioeconomic (SES) demographics with the greatest declines observed with increased age and higher SES.[18] GP pathology referrals for HbA1c tests showed a decline during the first wave of the COVID-19 pandemic. Victoria's testing rate decreased by 25.6% and in NSW by 19.1% when compared to 2018-19 data. An increase in patients with higher than recommended HbA1c levels was also observed indicating an impact on diabetic management and control. This finding may be the result of reduced access to medical facilities, changes in lifestyle and self-care practices, changing attendance patterns in general practice and/or changes to the timing of monitoring.[19]

There are several modelling studies that have tried to anticipate what additional chronic disease management burden Australia may experience due to interruptions to usual preventative health care and screening:

- Heart Foundation modelling of Medicare Benefits Schedule (MBS) and pathology data estimates that 345 heart attacks, strokes and heart disease deaths could have been prevented if more checks had occurred between March 2020 and July 2021 (it is estimated that 27,000 heart checks were missed).[20]
- Cancer services reimbursed through the MBS for the months January 2020 to December 2020 experienced an 8% reduction (163,595 fewer services) nationally for cancer-related diagnostic procedures[*] across all cancer types compared to the same period in 2019. Cancer-related surgical and nonsurgical therapeutic procedures were 9% lower (14,600 fewer services) than expected.
    - A 3-month delay in screening has been estimated to result in 90 deaths and excess costs of more than $12 million.[21,22]
    - The decline in the number of GP visits and pathology referrals in 2020 indicate a potential disruption to routine preventative cancer care and counselling activities in general practice.[18,]
    - Modelling of Breastscreen Australia data suggests that a six-month delay in breast cancer diagnosis, due to disruptions to screening, would result in 25 excess deaths over the next five years and 239 years lost over a 10-year timeframe in the Australian setting.[23]

Impact of deferral of elective surgery

During the COVID-19 pandemic, elective surgery[†] for non-time critical procedures was restricted or suspended to reduce the risk of infection, free hospital capacity, preserve personal protective equipment and avoid the known increased perioperative mortality risk of surgery undertaken in patients with COVID-19. A nation-wide cessation of surgery between February and May 2020, saw over 400,000 elective surgeries delayed with subsequent state-based restrictions.[24,25] This saw an increase in the waitlists for category 2 (needing treatment within 90 days) and category 3 surgeries (surgery needed within 12 months). Consequently, public hospital elective surgery admissions were 9.2% lower in 2019-20 (688,000) than in the preceding year (758,000).[26] The median waiting time for elective surgery in all categories has been increasing steadily since at least 2000 with the pandemic only accentuating this effect.[27] While admissions increased to equal pre-pandemic levels in 2020-21, the backlog of elective surgery has meant waiting times continue to rise. The median waiting time for all elective surgery increased from 39 to 48 days between 2019-20 and 2020-21. Only 75% of category 2 patients underwent surgery in the recommended 90 days, down from 81% in the preceding year. The proportion waiting longer than 365 days nearly tripled from 2.8% to 7.6%, with the greatest increases for total knee replacement (11% to 32%) and septoplasty (18% to 36%).[28]

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[*] MBS data analysed in this report do not include screening mammograms for breast cancer, faecal occult blood test (FOBT) screening for colorectal cancer, or human papillomavirus (HPV) cervical screening tests for cervical cancer or complementary services undertaken within the public sector.

[†] Elective surgery is any form of surgery considered medically necessary, but which can be delayed for at least 24 hours

For some patients, increased waitlist times will lead to an increased burden of disease and socioeconomic costs due to functional decline leading to increased morbidity and decreased quality of life, e.g. patients waiting for orthopaedic surgery to facilitate return to work. For other patients, delay of elective surgery will lead to progression of life-threatening disease. For example, the National Bowel Cancer Screening Program estimated that a reduction of 30% in follow-up colonoscopy compliance in 2020 would lead to approximately an additional 1,500 patients developing colorectal cancer in the period 2020-2060.[29]

Impact on primary care

Throughout the pandemic, GPs have been required to manage increases in service demand, adapt to changing practice protocols and support complex administrative and IT redesigns.[30] While GPs rose to the challenge of rapidly implementing telehealth, the fast transition experienced several process and infrastructure obstacles, such as sufficient outgoing phone lines and telecommunication equipment. Technical issues in video conferencing for both patients and clinicians resulted in many opting for telephone consultations that impeded effective communication as visual cues were missing.[17]

The use of telehealth in primary care during the COVID-19 pandemic was an essential measure that enabled some continuity of care. Despite the success of telehealth in this setting, there are circumstances where it is not suitable or impedes the quality of care provided. A recent Australian qualitative study, which explored the experiences of both specialists and GPs, found several key problems with the use of telehealth:[17]

- Some clinicians were not confident to start immediate treatment based on a telehealth consultation and opted to delay until a patient could be seen in person.
- Clinicians were concerned about missing important aspects of an assessment as telehealth relied on patient self-reporting rather than observation.
- Clinicians experienced difficulties in providing education and support for patients with chronic disease.
- Logistical challenges were experienced with coordinating multidisciplinary consultations with both patients and carers.
- At-risk patients, such as children or the elderly, were potentially overlooked.
- It is difficult for clinicians to gauge the level of a patient’s distress and to facilitate private discussion, which is particularly problematic for discussion of mental health issues and where patients are at risk of abuse in their household.
- Even where video was available, developing a therapeutic relationship is challenging, which can result in patients disclosing less in consultations.

The rapid uptake of telehealth prompted research into the needs of various groups. The use of telehealth was found to be least accessible to those from culturally and linguistically diverse communities, with low literacy levels, low socioeconomic status and people living in rural and remote areas.[31]

Aside from the dramatic increase of technology in primary care, the pandemic also facilitated exploration of increased partnership between general practice and community service providers. A publication from the Central and Eastern Sydney PHN identified the importance of integrated systems and the need to strengthen collaboration with community-based services and the not-for-profit sector to address digital language and cultural barries to accessing health services as well as ensuring a resilient service.[32] Enhancement of the coordination between primary care and community groups was identified to be important in ensuring continuity of care for those with chronic disease during the pandemic, particularly to bridge the care gap due to existing patient vulnerabilities or low resources.[30,33]

Another fast-tracked innovation, that has positively impacted primary care, is the introduction of electronic prescribing, which was already part of the National Health Plan and brought forward to assist with telehealth.[34] Electronic prescribing has allowed continuity of care as well as reduced administrative burden for healthcare providers. Between May 2020 and February 2022, 37 million electronic prescriptions were issued.[35]

Groups in vulnerable circumstances

Prior to the pandemic, there were gaps in equitable access to health care in Australia for vulnerable populations such as those in rural and remote areas and for Aboriginal and Torres Strait Islander people.[36, 37] The additional disruption COVID-19 has had on access to health care, unrelated to infection with the virus itself, has particular implications for vulnerable populations. Thus, strategies to promote continuity of care will need to be developed to cope with the specific needs of vulnerable populations.

A short, self-reported questionnaire conducted between April and May 2020 (at the beginning of the Australia's COVID-19 restrictions) sought to determine person-related factors that influenced their ability to access non-COVID related health care. Symptoms of depression and anxiety, doing unpaid work, living alone, low socioeconomic status, living on government benefits and personal experience of COVID-19 explained 44%-50% of the reduction in access to necessary health/disability care. As many of the risk factors also identify those with more disease and worse health outcomes generally, these findings can inform targeted strategies aimed at reducing an escalation of poor health outcomes post-pandemic.[38]

The COVID-19 pandemic has exacerbated the disparity between metropolitan and remote-rural dwellers in both physical and psychological primary health care. Compared to people in metropolitan areas, people in rural areas have poorer overall health, lower levels of education and are exposed to a greater risk of injury early in life. Despite these needs, health care in rural communities is challenged by sparse population, unpredictable socioeconomic and ecological circumstances, low numbers and out-migration of health professionals to cities and declining public health infrastructure.[39] To address these issues, the National Rural Health Commissioner prioritised increasing the scope of practice amongst rural GPs and developing competency in e-health and telehealth.[40]

Additional health burden due to COVID-19

As Australia continues its journey of "living with COVID", the management of people with COVID-19 is being integrated into routine care. Evidence-based guidelines suggest that most people with mild COVID symptoms can be appropriately managed in primary care.[41] Additionally, there are a growing number of people that report lingering symptoms post SARS-CoV-2 infection known as Long COVID (other terms include Post-Acute COVID Syndrome (PACS), Post-Acute Sequelae of COVID-19 (PASC) or COVID Long haulers) who will be need to be managed by the health system. However, this adds to the already high workload of primary care and may impact on the ability to focus on, and prioritise, chronic disease management.[33]

From the available literature, over 200 symptoms have been reported for Long COVID with fatigue being the most common persistent symptom reported.[42] As SARS-CoV-2 can affect multiple organs and systems, such as cardiovascular, neurological, renal, gastrointestinal, musculoskeletal and haematological, a broad range of symptoms are reported.[43,44,45] The scale of the additional demand placed on the health system to manage these patients is uncertain.

Outcomes from a NSW population-based cohort study found that 20% of people diagnosed with COVID-19 were still experiencing post-acute, or Long COVID symptoms one month post acute infection and 5% three months post.[46] Modelling of Omicron infection data from November 2021 to January 2022 suggests that Australia is likely to see between 80,000 and 325,000 people with Long COVID symptoms that last for at least 12 weeks. One year on from their initial infection, as few as 14,000 or as many as 170,000 Australians might still be experiencing Long COVID symptoms.[47] Given the lack of longitudinal cohorts, it is still not clear how effective vaccines are in preventing Long COVID following "breakthrough" infection compared to the unvaccinated.[48] It is also unknown what influence variants have on the prevalence of developing Long COVID. More details are provided in *NCHRAC Advice 29: Update on Long COVID* dated 26 April.

Another challenge related to long-term COVID-19 sequelae is that it is unknown what extent COVID-19 exacerbates chronic disease, causes chronic disease, or will be determined a chronic disease itself. Emerging evidence suggests that there is an increased risk of cardiovascular outcomes such as cerebrovascular disorders, dysrhythmia, inflammatory heart disease, ischemic heart disease, thrombotic disorders, cardiac arrest and heart failure 12 months post acute infection of SARS-CoV-2.[49] Lung damage has been visualised on CT scans and plain radiography that resolves gradually over time, however full recovery is variable and larger studies are required to determine whether COVID has exacerbated a pre-existing condition.[50]

It is also important to note that just as with chronic disease, COVID-19 disproportionately burdens Australians who are economically disadvantaged.[51] This worsens their ability to access care and manage their chronic disease.

Strategies for strengthening the health system

Prior to the COVID-19 pandemic, the Australian health system was already facing the challenges of an increasingly ageing population, a rising prevalence of chronic diseases and the growing cost of implementing new technologies.[52,53] Post pandemic recovery provides a rare window of opportunity to bolster the health systems to become more resilient. For this to happen change needs to occur at the system and service levels that will develop and support innovative models of care that are digitally enabled and underpinned by clear governance, policies and procedures to guide best practice care. At the practitioner level, health professionals need to be enabled to deliver evidence-based best practice and coordinated, patient-centred care. Patient-centred strategies need to focus on empowering patients to improve health literacy and enhance their ability to engage in informed, shared decision making.[54,55,56]

The Working Group considered the National Health Reform Agreement and other key national strategic documents focused on strengthening Australia's health workforce and primary care.[57,58,59] If implemented appropriately, these strategies would provide the foundational elements and enablers to remove the systemic barriers to providing high quality, coordinated care and reduce pressure on hospitals. For the effective control and management of chronic disease there needs to be a focus on:

- equity and access to services
- coordinated care that is evidence-based and patient centred
- early intervention/ prevention
- increasing health literacy
- interoperability of health data across sectors
- flexible funding models that enable services to suit local needs.

Strengthening primary care

Effective primary care can improve health outcomes at a lower cost than tertiary and secondary care and helps avoid unnecessary hospitalisations by providing comprehensive and preventive care. Countries with strong primary health care systems are also reported to have better health outcomes.[60] Primary care is the first point of call for communities during the acute phase of a health crisis, and provides the majority of treatment, screening, education, and coordination care for chronic disease. As such, strengthening primary care is an essential element to building a more resilient and responsive health system that can manage the future burden of chronic disease.[61] However, to improve health outcomes, primary care services need to be available, affordable, locally accessible and focus on the wider determinants of health.[62] During the COVID-19 Delta variant outbreak in October 2021, 14% of people with chronic conditions reported that they could not pay for health care or medicine because of a shortage of money and 24% did not fill a prescription or omitted doses of medicine with over a third reporting that this was because of cost. Also, 30% of people with chronic conditions were not confident they could afford needed care if they became seriously ill.[63]

Integrated and coordinated care

Health policies and programs are often designed in isolation from one another, even though patients access services across sectors and programs. This fragmentation makes it difficult for people to receive well-coordinated care and can cause confusion for people trying to navigate health and social services, as well as causing duplication of effort and inefficiencies. This results in poorer health outcomes for those with complex chronic conditions, frailty or of older age.[57] Investment in the coordination of services across settings will be an important step in improving equitable access and quality of care for people with chronic disease. A recent review into organisational models in primary health care to manage chronic conditions, found that efforts should allow flexible community involvement to account for local needs.[33]

The current split in funding for health across states, territories and the Commonwealth through multiple programs does not encourage innovation or flexibility in care models, such as team-based care. Funding arrangements also need to recognise the different challenges of providing care in urban, regional, rural and remote settings. With the anticipated increase in chronic conditions and complications due to delays in diagnosis and treatment, priority should be given to funding models that support high quality coordinated care that focus on prevention/early intervention. This is particularly true in regions where disruptions to health care services have been substantial.

The COVID Positive Pathway study illustrates a collaborative model of care involving the Victorian public health unit, hospital services, primary care, community organisations, and the North Western Melbourne Primary Health Network. With flexible funding, a focus on outcomes and digital health technologies that provided integrated data across sectors, this multidisciplinary, tiered model of care enabled about 80% of people with COVID-19 to be adequately supported by primary care and community organisations. This allowed hospital services to be reserved for people with more severe illness or with risk factors for disease progression.[64] The principles of this model could be applied to other chronic health conditions if regulatory and funding barriers to information-sharing and care delivery by health care providers can be overcome.[65]

Enhancing health data and digital infrastructure

Establishing the ability to collect, share and securely store health data that is linked at a regional level is an important element to track and understand a patient's experience across the health system. Interoperability across sectors will reduce fragmentation of care, drive value-based care and support better decision making for complex health conditions thus improving health outcomes. The establishment of Commonwealth-State patient-level primary and community health care datasets can inform the development of quality indicators that support shared decision making and service planning across the primary, community and acute sectors. This can also be utilised for policy and research purposes to improve patient experience and outcomes and health system efficiency.[57,59]

The long-term effects of any reduction in screening and detection of disease will not be known for some time, and thus it is important to continue to monitor the effects of the changing situation. Electronic medical records (EMRS) are valuable for identifying and contacting vulnerable patients who need close monitoring as they are at increased risk of developing disease or worsening conditions e.g., poorly controlled diabetes, hypertension or chronic obstructive pulmonary disease. Data sharing across sectors will be valuable in implementing risk stratification strategies to identify those at greatest risk and who require follow up. For example:

- BreastScreen Australia identified those participating for the first time and those who had not had screening for more than 27 months to be at highest risk and prioritised for mammography screening.[66,67]
- Rapid catch-up testing for cervical screening is recommended or implementation of at-home testing which is an effective means of avoiding disruption of services.[68,69]
- The reintroduction of heart heath checks, which were added as a temporary item to the MBS in 2019, for at risk Australians aged 45 years and over, and 30 years and over for First Nations peoples.[70]
- Monitoring, management and risk-based prioritisation of people on elective surgery waitlists combined with implementation of evidence-based models of care at the system level can improve patient flow and efficiencies.[54]

Advancing telehealth services to support chronic disease management

Telehealth provides an excellent opportunity for the delivery of health care and monitoring of patients with non-communicable diseases and can significantly enhance access to safe, quality care, especially in rural/remote areas where in-person contact is difficult.

Physical and psychological health care in rural areas presents challenges and requires tailored innovations to complement and not replace face-to-face care. Optimal integration and utilisation of health services for people in rural/remote areas will require a focus on joint training and co-location of multidisciplinary primary healthcare teams as much as possible.[65] Whilst addressing social and technological barriers to telehealth remains essential for the population due to a lack of local health services, a culture of self-reliance and barriers to urban health care mean that local care in rural areas is essential.[71] A focus on supporting health professionals in rural areas with incentives and infrastructure remains imperative.[39]

Strategies to maximise the health system utility and improve equitable access to telehealth include:

- Triaging of patients ahead of time to determine if telehealth consultations are appropriate or if in-person attendance is necessary[72]
- Improving digital infrastructure to increase telehealth capacity, such as upgrading IT systems, telehealth software, infection control or upskilling staff[72]
- The development of partnerships amongst internet service providers, health technology companies and healthcare services to develop accessible platforms and overcome technology barriers[65]
- Establishing specialised telehealth only clinics[72]
- Increasing the uptake of video for telehealth service delivery (currently 95% is delivered over the phone)[58]
- Ensuring patients who have limited access to digital health systems are still able to access care in ways that keep them and others safe.

Health workforce

Before the COVID-19 pandemic Australia’s health system faced challenges with maintaining enough experienced health professionals and carers to meet the growing demands from an ageing population and increased prevalence of chronic disease.[73] The prolonged demand to manage COVID-19 exposed the severity of the skilled workforce shortage. This shortage was worsened by the fact that healthcare workers were 2.7 times more likely than the general population to contract COVID-19 and there are significant challenges in maintaining their safety and wellbeing.[74,75,76] It has been reported that approximately a quarter of the nurses, midwives, doctors and allied health staff surveyed during the first wave of the pandemic in Australia (i.e. January to April 2020) experienced symptoms of psychological distress.[41,75] The likely impacts of resulting resignations and retirement, especially for those working in rural and remote areas, will have profound consequences on the delivery of proximate care.

COVID-19 will continue to challenge Australia's healthcare worker capacity due to their increased risk of acquiring Long COVID, work-related stress due to unmet backlogs from delayed procedures and services and the ongoing demand for non-COVID related issues.[77] Strategies of redirecting staff from low priority areas to assist with managing the pandemic response is just one temporary method for managing demand during the pandemic, e.g. the postponement of some elective surgeries in the private sector. However, long term management of workforce attrition needs to focus on increasing in the number of healthcare workers; promoting workforce flexibility and capability within and between the various disciplines; and supporting healthcare workers to sustain them in practice.[78] The lack of a single source of health workforce data impacts on the ability to forecast and plan based on supply and demand.

The National Medical Workforce Strategy 2021–2031, the Primary Health Care 10 Year Plan and the National Health Reform Agreement Roadmap all highlight the need to strengthen and develop Australia's health workforce to be better coordinated and patient focused.[57,58,59] This could be achieved through examination and implementation of staged innovative funding and care models, workforce planning and the collection of data that enables the development of local solutions to support access. Addressing the geographic disparities in patient access to GPs, specialists and other healthcare professionals will assist in improving health outcomes. A number of areas of focus are discussed below.

Integrated *multidisciplinary primary care*

National planning, across various sectors, is required to build a sustainable future primary healthcare workforce that is well-supported and locally coordinated. Integrated and coordinated multidisciplinary care needs to be underpinned by continuity of care principles and funding models to support equitable access to health services and care.[79] Planning should include the integration of community health workers, who if integrated in primary health care services can deliver information related to protection, raising awareness, countering social stigma as well as self-management of chronic conditions.[61]

Increasing health professionals*' scope of practice*

Enabling disciplines to work at the top of their scope will create workforce capacity through flexibility within and between the various health disciplines. During the pandemic nurse lead clinics in rural Victoria, which provided after-hours care, suggested that this was valuable in ensuring access to care whilst reducing the burden of on-call duties for rural GPs.[80] Consideration needs to be given to previous impediments such as policy and legislation constraints and resistance from the medical profession.[81,82]

Addressing distributional challenges of primary care practitioners

New funding models are needed to better remunerate practitioners in rural and remote areas and promote generalist medical careers as well as increase clinical support including after-hours and 'on-call' arrangements.[59] This also applies to other health disciplines that face the same challenges in recruiting and retaining practitioners in rural locations.[83,84]

Patient empowerment and supporting health literacy

Patients need continued support and encouragement from their primary care team to stay on track to manage their chronic conditions, especially those who are vulnerable and may be isolated during periods of extended lockdown.[33] Improving health literacy enables people to understand their health, make informed health choices and seek care appropriately. An increased focus on self-management particularly through co-design of services, collaboration with providers will see an improvement in health outcomes and ensure people to appropriately seeking health care.

Investment in both hospital inpatient and residential aged care capacity

The number of approved public hospital beds per 1000 population aged 65 and over in Australia has more than halved since 1991, from approximately 33 in 1991-92 to 16 in 2018-19.[27] While much of this change has been an efficiency dividend of improvements in medical technology and models of care, the current long waiting times for elective surgery, along with challenges to patient flow for emergency presentations, have been attributed to hospital inpatient capacity that is considered by some to be inadequate to meet the demand of an expanding and ageing population.[27] Many patients with complex nursing care needs currently occupy hospital inpatient beds while waiting for residential aged care accommodation and other forms of community support. Investment in such facilities and services could be a more cost effective and patient-centred alternative to expansion of hospital inpatient capacity alone.

Research gaps

Further research in the Australian context would be useful to address the following questions or topics:

- What investment in extra capacity would be the most cost-effective?
- How best to build resilience and strengthen systems, aiming for a sustainable health system which can meet future crises?
- Analysing the impact of the pandemic on chronic disease management to inform whether additional resources would best be spent on screening programs, primary care clinic capacity, or evaluation of progressively trialling, evaluating, refining and scaling up joint planning and funding.

Approach

Consideration was given to narrative reviews of the literature examining the impact of the pandemic on health service delivery and burden of disease; reports from health specific organisations, government departments and research organisations on the increased risk of adverse health outcomes due to COVID-19 disruption to health service utilisation; and innovative models of care adopted in Australia because of movement restrictions during the first wave of the of the pandemic in 2020.

Issues considered included delays, disruptions or interruption to:

- population-based screening programs e.g. breast and cervical cancer
- routine health checks commonly conducted in primary care to monitor or detect disease
- early diagnosis of symptomatic disease that result in delayed treatment
- treatment or review of management plans for chronic conditions
- treatment requiring elective surgery or other secondary or tertiary care.

Heterogeneity in access to care was also considered; that is the impact on groups with vulnerable circumstance e.g. people experiencing socioeconomic disadvantage, in rural and remote settings, Indigenous Australians, culturally and linguistically diverse populations and people with disability.

Limitations:

- Most of the published literature analyses data from the early months of the pandemic (March-September 2020) when the burden of COVID-19 had not been as high as in many other countries around the world.
- There is insufficient detail on the specific impact on vulnerable populations.
- The course of the disease is still unknown.

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