Policy Document

Pandemics and Epidemics (2024)

Executive Summary

Pandemics and epidemics represent some of the most significant health and social challenges to our society. As future medical professionals, medical students must act as advocates for the community, especially in situations of unequal burden and structural disadvantage. The policy directly addresses the unequal burden of health and social outcomes experienced by structurally disadvantaged populations during pandemics and epidemics, examining the role of existing health inequities, disproportionate burdens of poor health, structural and institutional forces, policy decisions and the social determinants of health. Pandemics and Epidemics are then discussed in broad sections covering prevention and preparedness, health infrastructure, healthcare responses, whole of government responses and the post-pandemic and epidemic period. Across these sections, the policy argues for broad improvements to the whole of government collaboration and cooperation, greater international cooperation, robust improvements to mental health systems and addressing the root causes of mental distress, and finishes with important lessons to be learned from the COVID-19 pandemic.

AMSA calls upon the Australian Federal Government to collaborate with all levels of government to ensure free and equal access to healthcare and increase investment in health infrastructure and systems, including provision and stockpiling of PPE, increase global health cooperation and engagement, increase financial assistance and root cause mental health support funding, and to take meaningful action on climate change. Other relevant stakeholders, including State and Territory Governments, should collaborate to ensure free and equal access to healthcare and increase investment in health infrastructure and systems, including provision and stockpiling of PPE, provide support and funding for improved family and intimate partner violence services, contribute to ongoing pandemic and epidemic research, establish unified response policies and protect private data collected during pandemics and epidemics. AMSA calls upon healthcare employers to continue working with governments to improve healthcare infrastructure and systems, provide adequate PPE for all HCW and ensure health student safety. AMSA also calls upon Australian Universities and Medical Schools to continue working with governments to improve healthcare infrastructure and systems, provide adequate PPE for all HCW and ensure health student safety, offer financial support for students, and respond appropriately to changes in education during pandemic and epidemic events.

Head Office
A Level 1,
39 Brisbane Avenue,
Barton, ACT 2600

Postal Address
PO Box 6099,
Kingston, ACT 2604

ABN:
67079 544 513

Email:
info@amsa.org.au

Website:
www.amsa.org.au

Policy Points

AMSA calls upon:

1. The Australian Federal Government to:
    a. Ensure all people have equal access to free healthcare services associated with the diagnosis, treatment, and prevention of pandemic and epidemic associated illnesses;
    b. Collaborate with all levels of government to restore investment in Australian health infrastructure and systems, providing a strong foundation for good health prior to, during and following pandemics and epidemics, through:
        i. Adequate funding of universal health coverage through long term sustainable financing;
        ii. Expanded funding for telehealth services across the entire health sector, that reach individuals who are unable to access in-person healthcare;
        iii. Expanded funding for primary care services that can reduce the burden on hospitals during pandemics and epidemics;
    c. Recognise the persistent impacts of pandemics and epidemics on the health and safety of the community by adequately responding to and funding post-pandemic and epidemic healthcare services that;
        i. Recognise the ongoing impact of chronic disease in the post-pandemic and epidemic society;
        ii. Establish formal, more long-term processes for receiving support and care for individuals and communities experiencing the persistent effects of disease and illness;
    d. Advocate for global cooperation in the open dissemination of epidemiological and scientific data relating to the epidemic or pandemic;
    e. Improve global collaboration through multinational engagement across healthcare and logistical sectors through:
        i. Support for multilateral efforts that facilitate equitable distribution of vaccines, personal protective equipment, medical equipment and other necessary supplies;
        ii. Support for multinational organisations like GAVI to strengthen vaccine equity internationally, particularly in developing regions;
        iii. Advocacy efforts to ensure equitable distribution of vital supplies to all nations;
        iv. Support for the development of health care systems in developing countries through expertise, sustainable funding and continued advocacy;
        v. An open process of collaboration and sharing of best practices in managing pandemics and epidemics;
    f. Acknowledge the impact of anthropogenic climate change in current and future epidemics and pandemics and take meaningful action to;

i. Phase out the use of fossil fuels, including ceasing the approval of new fossil fuel projects in Australia;
ii. End fossil fuel subsidies that are encouraging further development in the sector;
iii. Introduce taxation and other revenue measures that requires polluting businesses to fund action on climate change, addresses natural disaster preparedness and relief, and provides financial support for workers transition out of polluting sectors;

g. Improve the financial security of all people during pandemics by raising the rate of income support available to all individuals;
h. Undertake a gendered needs assessment and acknowledge the gender-specific health needs of individuals during pandemics and epidemics;
i. Adopt measures to regulate the accessibility and affordability of food products to prevent food insecurity and deprivation;
j. Support the operation of Primary Health Networks during pandemics and epidemics in order to provide adequate health care access, resources and communication to structurally disadvantaged communities;
k. Adopt and implement the One Health principles in all areas of human-animal interactions to;
    i. Minimise the future risk of intrusion into natural habitat;
    ii. Reduce the future incidence and distribution of zoonotic and arboviral diseases in previously unaffected areas;
    iii. Reduce the risks to vulnerable populations from future epidemics and pandemics;
    iv. Encourage sustainable development and growth that minimises close contact between humans and wildlife;
l. Collaborate with all levels of government to adequately fund and provide support for ongoing research into pandemic and epidemic preparedness, responses and post-period support for the community;
m. Collaborate with all levels of government to implement legislation that protects the data, privacy and information obtained during the collection of health data during pandemics and epidemics, especially those collected in contact tracing applications;
n. Collaborate with all levels of government to improve the accessibility and usability of contact tracing and health information applications;
o. Continue to work with all levels of government to strengthen cooperation, collaboration and communication regarding health infrastructure, health systems, and emergency responses, including;
    i. Improved health surveillance systems in existing health institutions through:
        1. Streamlined processes for reporting cases of concern;

2. Improved education and training for healthcare workers in the identification of ongoing pandemic and epidemic health risks to all members of the public;

ii. Established unified national pandemic and epidemic response policies;

iii. Established minimum standards for the adequacy, availability and accessibility of personal protective equipment (PPE) to frontline Health Care Workers (HCWs) through:

1. Expansion of the National Medical Stockpile of PPE and other medical resources;
2. Reduced reliance on potentially volatile international supply lines;
3. Fast and efficient mobilisation of local PPE production supported by government initiatives and incentives;

2. State and Territory Governments to:

a. Recognise the persistent impacts of pandemics and epidemics on the health and safety of the community by adequately responding to and funding post-pandemic and epidemic healthcare services that;

i. Recognise the ongoing impact of chronic disease in the post-pandemic and epidemic society;

ii. Establish formal processes for receiving support and care for individuals and communities experiencing the persistent effects of disease and illness;

b. Collaborate with all levels of government to restore investment in Australian health infrastructure and systems, providing a strong foundation for good health prior to, during and following pandemics and epidemics, through:

i. Adequate funding of universal health coverage through long term sustainable financing;

ii. Expanded funding for telehealth services across the entire health sector, that reach individuals who are unable to access in-person healthcare;

iii. Expanded funding for primary care services that can reduce the burden on hospitals during pandemics and epidemics;

c. Collaborate with all levels of government to adequately fund and provide support for the development of improved mental health services through;

i. Increased funding for multidisciplinary approaches to the root causes of mental distress in pre-, during and post-pandemic and epidemic events;

ii. Improved social support for all individuals to address ongoing and persistent causes of mental distress, especially for structurally disadvantaged populations;

d. Ensure funding and increased support for victims of family and intimate partner violence at all times, including;

i. Increased investment and provision of multidisciplinary approaches to address and prevent the root causes of family and intimate partner violence;
ii. Funding housing services to provide safe locations for victims fleeing family and intimate partner violence;
iii. Increased financial and social support for victims of family and intimate partner violence;

e. Collaborate with all levels of government to adequately fund and provide support for ongoing research into pandemic and epidemic preparedness, responses and post-period support for the community, including;
    i. Emerging and existing infectious diseases, rapid affordable testing methods, preventative vaccinations, safe and effective treatments, and their potential impact on vulnerable populations;
f. Continue to work with all levels of government to strengthen cooperation, collaboration and communication regarding health infrastructure, health systems, and emergency responses, including:
    i. Improved health surveillance systems in existing health institutions through:
        1. Streamlined processes for reporting cases of concern;
        2. Improved education and training for healthcare workers in the identification of ongoing pandemic and epidemic health risk to all members of the public;
    ii. Established national pandemic and epidemic response policies;
    iii. Established minimum standards the adequacy, availability and accessibility of personal protective equipment (PPE) to frontline Health Care Workers (HCWs) through:
        1. Expansion of the National Medical Stockpile of PPE and other medical resources;
        2. Reduced reliance on potentially volatile international supply line;
        3. Fast and efficient mobilisation of local PPE production supported by government initiatives and incentives;
g. Collaborate with all levels of government to implement legislation that protects the data, privacy and information obtained during the collection of health data during pandemics and epidemics, especially those collected in contact tracing applications;
h. Collaborate with all levels of government to improve the accessibility and usability of contact tracing and health information applications;

3. Healthcare Employers to:
    a. Collaborate with all levels of government to establish and implement minimum standards for the adequacy, availability and accessibility of personal protective equipment (PPE) to Health Care Workers (HCW);

b. Ensure medical student safety and wellbeing, especially during the implementation of surge workforces through:
    i. Implementation of formal contracts for employment and remuneration;
    ii. Appropriate remuneration in line with expected workplace standards;
    iii. Access to indemnity insurance and full workplace industrial relation protections;
    iv. A clear opt-in process for surge workforce participation;
    v. Mandatory training and supervision of all students and surge workforce employees during pandemics and epidemics;
    vi. Training and supervision for providing telehealth services in primary care placements;
c. Continue to work with all levels of government to strengthen cooperation, collaboration and communication regarding health infrastructure, health systems, and emergency responses, including;
    i. Improved health surveillance systems in existing health institutions through:
        1. Streamlined processes for reporting cases of concern;
        2. Improved education and training for healthcare workers in the identification of ongoing pandemic and epidemic health risk to all members of the public;

4. Australian Universities and Medical Schools to:
    a. Collaborate with all levels of government to establish and implement minimum standards for the adequacy, availability and accessibility of personal protective equipment (PPE) to Health Care Workers (HCW);
    b. Ensure medical student safety and wellbeing, especially during the implementation of surge workforces through;
        i. Implementation of formal contracts for employment and remuneration;
        ii. Appropriate remuneration in line with expected workplace standards;
        iii. Access to indemnity insurance and full workplace industrial relation protections;
        iv. A clear opt-in process for surge workforce participation;
        v. Mandatory training and supervision of all students and surge workforce employees during pandemics and epidemics;
        vi. Training and supervision for providing telehealth services in primary care placements;
        vii. Accessible mental health support for all medical students;
    c. Offer financial support to all students experiencing financial hardship as a result of pandemics or epidemics by:
        i. Offering flexible payment plans for students paying fees upfront;
        ii. Creating and advertising solutions such as emergency relief grants and crisis relief funds;

iii. Providing equitable fee reductions for students where financially viable for the university;

d. Consider the viability of clinical placements where there is risk of harm to students and those they interact with;
    i. In assessing the level of risk to a student, consideration should be made of the student's personal health and the health of their family members and dependents;
    ii. Efforts should be made to mitigate the risk of clinical placements that are continued by:
        1. Taking into account the individual circumstances of all students participating in the placement; and
        2. Ensuring that no student is disadvantaged for not participating in a placement that poses significant risk to the student or those they interact with;
e. Support students experiencing food insecurity by improving access to nutritious food on campuses;
f. Offer the return of face-to-face classes as soon as safe and practicable following pandemics and epidemics;
g. Research the possibility of using adaptive learning and virtual simulation in a widespread teaching environment during pandemics;
h. Ensure that progression through medical school is not impeded by infectious disease outbreaks when core competency standards can be met;
i. Accommodate family and caring responsibilities, such as those due to childcare and school closures;
j. Create and distribute clear and accessible policies to address issues raised by pandemics and epidemics, including but not limited to policies regarding;
    i. International, interstate, and rural students returning home;
    ii. Support for students at risk of social isolation;
    iii. Minimisation of student movement to and from at-risk areas for placements;
    iv. The process of changing assessment delivery and communicating these changes with students;
k. Educate medical students on pandemic and epidemic causing pathogens and broader principles of diagnosis and management, and long-term community-based care for ongoing health conditions and complications that result from diseases and illnesses;
l. Educate medical students on the role of anthropogenic climate change in the development of pandemics and epidemics.

Background

The Australian Medical Students' Association (AMSA) is the peak representative body of over 17,000 medical students across the country. AMSA believes that the health of all individuals, communities and the global ecosystem are the core of what health professionals should concern themselves with. Together with the entire healthcare sector, AMSA believes that Pandemics and epidemics represent some of the most significant health and social challenges to our society. As future medical professionals, medical students must act as advocates for the community, especially in situations of unequal burden and structural disadvantage.

Pandemic and epidemic are terms that describe the spread of infectious diseases. Epidemiologists define these terms based on the rate of disease transmission rather than the severity of the illness itself. [1] An epidemic occurs when there is an unexpected surge in the number of disease cases within a specific geographical area. Examples include outbreaks of yellow fever, smallpox, measles, and polio. The WHO declares a pandemic when a disease's growth becomes exponential, meaning that cases multiply more rapidly each day. It is not about virology, immunity, or disease severity. A pandemic transcends national borders, affecting multiple countries and populations. It leads to large-scale social disruption, economic losses, and general hardship. [1]

Structurally Disadvantaged Populations

Structurally disadvantaged populations represent those who experience the greatest burden of poor health across their lifecourse, which is also exacerbated during pandemic or epidemic events. While previously understood as vulnerable communities, the term structurally disadvantaged is a more precise and inclusive term that focuses on the characteristics and circumstances that place individuals and communities at increased risk of harm. Shifting the focus from the individual or community to the issues they face, is important in examining the structural forces that facilitate and perpetuate health inequalities. [2,3]

The factors that increase vulnerability and generate structural disadvantage include:

- Health inequities: The unequal distribution of healthcare resources impacts access to healthcare, diminishing healthcare opportunities and entrenching poorer health outcomes;
- Disproportionate burden of poor health: Groups made vulnerable may have higher levels of physical and chronic illness that place them at greater risk of developing severe forms of other illnesses, especially those faced in pandemics and epidemics;

- Structural forces: Groups are made vulnerable as a result of underlying structural and institutional forces such as racism, ageism, economic exploitation, and colonisation that create and perpetuate inequity;
- Policy decisions: Policy actors exert control over groups through process of enabling or limiting rights, access and imposing responsibilities of individuals and groups that promote or inhibit opportunity and can increase uncertainty, stability and vulnerability;
- Social determinants of health: disadvantaged groups face an undue burden of risk as a result of poverty, inadequate housing, limited access to education and discrimination, contributing to poor health outcomes across the lifecourse. [2]

Aboriginal and Torres Strait Islander Populations

Aboriginal and Torres Strait Islander populations have been previously identified as populations at higher risk during the 2009 Influenza (H1N1) and COVID-19 Pandemics, due to ongoing and systemic failures of health systems and institutions in Australia, resulting in increased rates of mortality and morbidity compared to non-Indigenous Australians. [2,4,5]

The Australian Health sector attributes these outcomes to structural disadvantage that exists both within the context of pandemics and epidemics, and persists outside of these contexts too. The lack of access to healthcare resources, such as primary care, PPE and laboratory testing, prevents early detection and prevention of disease within remote areas. Higher numbers of Indigenous Australians live in 'remote' and 'very remote' regions compared to non-Indigenous Australians, where healthcare resourcing is lacking compared to metropolitan and urban settings. [6] High rates of homelessness as a result of inadequate housing for Indigenous people and within Indigenous communities results in overcrowded housing or the absence of clean, safe and reliable housing, thus increasing transmission risk.[7] Further, resource constraints and culturally inappropriate protocols and systems diminish the effectiveness of protective emergency measures for Indigenous Australians. [8,9]

'Aboriginal health' encompasses physical, spiritual and cultural wellbeing. In the Mayi Kuwayu National Study of Aboriginal and Torres Strait Islander Wellbeing (2014) tangible elements of Indigenous culture were identified as directly impacting their health and wellbeing. These cultural determinants now underpin the framework of the 'Close the Gap' campaign. [8,10]

In the past, Governments have failed to acknowledge the impact of Indigenous culture in emergency response plans due to a lack of Indigenous representation at

a jurisdictional level. The 2009 National Action Plan for Human Influenza Pandemic omitted First Nations people, and consequently Indigenous Australians had higher diagnosis rates, intensive care admissions and hospitalisations compared to non-Indigenous Australians. [4,11] Although the National Aboriginal Community Controlled Health Organisation (NACCHO) Affiliates, and the Aboriginal Community Controlled Health Services (ACCHSs) were involved in providing risk reduction education, and the Indigenous Flu Network (IFN) aimed to deliver National Medical Stockpile resources to remote areas; their role was limited by restricted jurisdictional Access. [4]

The effectiveness of Indigenous representation is evident in the Aboriginal and Torres Strait Islander Advisory Group on COVID-19, co-chaired by NACCHO and the Department of Health (DHS). This group reports to the Australian Health Protection Principal Committee (AHPPC); the peak decision-making body for health emergency management in the Commonwealth. Health-care access has been improved through GP led respiratory clinics, increased telehealth availability, and rapid SARS-CoV-2 testing. This group has been instrumental in advocating to ensure Indigenous communities are a priority group in the national response to future pandemics. [4] Further, Indigenous communities have faced epidemics for centuries and are aware of strategies that worked for their communities in the past. [12] The preparedness and knowledge of these communities must not be underestimated. During the COVID19 pandemic numerous Indigenous land councils implemented travel and visitor restrictions prior to Australian government lockdowns. [12]

Low-Resource Communities

Pandemics and epidemics disproportionately affect socioeconomically disadvantaged nations and populations. [81] On a global level, some lower- and middle-income countries do not have the financial, infrastructural, systemic and technical capabilities to successfully respond to epidemics and pandemics without assistance. [82,83] Models have estimated that if a pandemic similar to that of the 1918 Spanish Flu emerged today, 96% of deaths would occur in socioeconomically disadvantaged nations. [84] Even beyond the moral obligation for global social justice, the provision of aid by higher-income countries and organisations provides benefits in securing domestic health, driving long-term economic growth and creating healthy diplomatic relations.

Social and economic determinants of health, such as access to healthcare and information, hygiene and sanitation, malnutrition, crowded housing and financial dependence on work predispose socioeconomically disadvantaged populations to infectious diseases. [85–87] Despite this disparity being well-documented, there is a severe insufficiency of government preparedness plans and WHO guidelines to

explicitly identify these disadvantaged populations, as well as the strategies necessary to assist these populations within the context of pandemics. [85,86,88]

Rural and Remote Communities

Australians living in rural and remote areas have a reduced life expectancy, higher chronic disease burden and poorer access to healthcare than those living in metropolitan areas [48]. This places rural and remote Australians at higher risk to poor outcomes during a pandemic or epidemic. Pre-existing lack of access to quality healthcare and subsequent requirements to travel long distances to receive specialised care are exacerbated during pandemics and epidemics due to lockdown measures and travel restrictions. [89]

Health services in rural and remote regions frequently experience health workforce shortages, have little to no PPE stockpiles, lack testing facilities and may not have ICU capacity to care for critically ill patients. Rural and remote services are therefore inherently less prepared to deal with infectious disease outbreaks. [90,91] Services such as the Royal Flying Doctor Service (RDFS) are essential in times of increased need to provide personnel, PPE, testing, and retrievals. [91]

Alongside the deficiencies in rural health services, Australians living in rural and remote communities are more likely to experience negative financial impacts during a pandemic or epidemic. Rural and remote Australians generally have lower incomes than those living in metropolitan areas, yet have to pay higher prices for goods and services. [90] Import and export barriers during a pandemic in particular, are likely to further increase these prices, and may increase food insecurity for rural and remote Australians. [90]

Pregnancy Health

Pregnancy health refers to the 'health of pregnant people during pregnancy, childbirth and the postpartum period'. Neonatal care focuses on delivering health care services around the time of birth and the first weeks of life. Antenatal care (ANC) is a service that reduces the rate of maternal and neonatal deaths. [92] It provides pregnancy surveillance, immunisation coverage, and early identification of underlying complications. Education is also provided to the parent about mental and sexual health, breastfeeding and the use of illicit substances. STI screening is an optional, but recommended part of ANC for parents. Missed diagnoses of these conditions can lead to spontaneous abortions, ectopic pregnancy, preterm birth and neonate infection. [93] Without the impact of a global pandemic or epidemic, 295,000 Pregnant people died globally in 2017 from preventable complications during pregnancy, 94% of which were due to a lack of access sufficient to ANC. [94]

During the Ebola epidemic, local health care systems were unprepared for the impact on health resources and services. This resulted in limited access to ANC and family planning, a significant decrease in appointment attendance, and consequently an estimated 3600 maternal, neonatal and stillbirth deaths. [95,96] Further, during the COVID-19 Pandemic it was estimated that 116 million babies would be born. [97] Most governments implemented national clinical guidelines on ANC but did not implement enough research on vertical transmission, risk of preterm delivery, and the association between disease severity and pregnancy. [98–100] Due to such ambiguity, ANC appointment attendance decreased as pregnant people feared for their personal safety, and that of their unborn child. [100,101] Australian governments responded to the COVID-19 Pandemic by transitioning most ANC to Telehealth. Pregnancy appointments were reduced to three visits with pregnant people being asked to 'self-monitor', pivotal screening tests were remitted, education sessions were online, all support groups were suspended, and neonatal and post-partum appointment protocols were delayed. [100] Additionally, this meant a lack of face-to-face social support for socially isolated pregnant people, or victims of domestic violence. [102] This is particularly important as suicide is a significant cause of pregnancy death in Australia. [104]

Not only do the social and political conditions affect healthcare access and service suitability during pandemics and epidemics, the diseases themselves can have a profound impact on birthing parents and their children. Data from the United Kingdom demonstrated that maternal deaths had significantly risen in the period 2020-22 to the highest rates in twenty years, even when excluding deaths directly linked to COVID. [156] Thromboembolism and thrombosis associated with COVID presented the greatest mortality risk to pregnant individuals, with death directly as a result of COVID being the second highest risk. [165] Further research demonstrates that pregnant individuals are at significantly increased risk of maternal mortality, admission to the intensive care unit (ICU), receiving mechanical ventilation, receiving any critical care, and being diagnosed with pneumonia and thromboembolic disease. [157] In addition, Neonates born to women with SARS-CoV-2 infection are more likely to be admitted to a neonatal care unit after birth, be born preterm or moderately preterm, and be born with low birth weight. [158] These findings demonstrate the significant adverse health effects of COVID both as a product of systems and structures, and the specific health effects of the ongoing COVID-19 pandemic.

Family and Intimate Partner Violence

Times of crises have been linked with increased episodes of interpersonal violence, including the increased incidence and prevalence of family violence and domestic violence. [102] Whilst often used interchangeably, domestic violence refers to

incidences of violence and intimidation between two individuals who are in an intimate relationship, whilst family violence refers to incidences of violence between family members. [103]

Within Australia, 1 in 6 women have experienced physical or sexual violence from a current or previous intimate partner, with 1 woman killed every 9 days by a partner. [102] Women are disproportionately represented, with more than 60% of domestic violence victims identifying as female. [102] These statistics are exacerbated during epidemics and pandemics as a result of the strict lockdown and physical distancing measures which are implemented to prevent infection transmission. [104] This is exacerbated by factors such as loss of income, isolation, stress and overcrowding which increase during periods of epidemics and pandemics. [104] These factors make women more vulnerable to domestic and family violence, as they further enable: the social isolation of victims, the economic vulnerability of victims due to workforce participation limitations and job loss and the caring responsibilities of women due to the closure of schools and other carer services. [102–105] These have been associated with spikes in pandemic-related intimate partner violence.

Juxtaposed alongside this, there is also an increased demand for domestic and family violence support services. [106] Globally, reports from hotline services have indicated increases in immediate service utilisation in the UK, China, Spain and France since the onset of the COVID-19 outbreak. [107] Within Australia, the Family courts and Magistrate courts received more than 300 calls a day in April 2020; this is a fifty per cent increase compared with March 2020. [108] Furthermore, the Victorian police received an additional 200 calls a week in April in comparison with the same month in 2019, with fifteen per cent of these cases citing COVID-19 as a precipitating cause.

LGBTQIASB+ Individuals

LGBTQIASB+ includes individuals who are lesbian, gay, bisexual, transgender, queer, intersex, asexual, sistergirls, and brotherboys. The '+' includes those with a diversity in gender expression, sexual orientation and sex characteristics [163]. Despite positive shifts in perceptions toward the LGBTQIASB+ community, discriminatory attitudes and stigma are still present [147, 148]. This has a profound impact on the vulnerability of this population during a pandemic or epidemic, by limiting their socioeconomic resilience, access to equitable healthcare, and increasing their susceptibility to mental health issues.

Workplace discrimination towards LGBTQIASB+ individuals results in higher rates of unemployment, wage and promotional disparities, as well as unstable housing situations. This impedes their resilience to the economic impacts of a global health

crisis [35,36]. Additionally, LGTBQIASB+ individuals are at higher risk of developing mental health conditions which may be exacerbated by the restrictive measures of a health emergency. Physical isolation prevents community connection, and potentially isolates individuals with family members who are not accepting of their sexual orientation [151, 152]. Further, LGBTQIASB+ youths are unable to attend schooling and extra-curricular activities that act as important support networks [152].

Lastly, the LGBTQIASB+ community is at high risk of severe disease outcomes during a global health emergency. Stigma and queerphobia within hospitals and clinics lead to actual, and feared health care disparities, often resulting in LGBTQIASB+ individuals not seeking healthcare when presenting with symptoms [148, 151, 155]. Moreso, this population has higher rates of some comorbid conditions (HIV, cancer, sexually transmitted disease, smoking and substance abuse) and may be reliant on specific medication regimes [152, 147, 148]. This makes them more susceptible to infection, and dependent on resources which may be strained during a pandemic or epidemic [156,153].

Individuals Living with Disabilities and Chronic Health Conditions

In Australia, 18 percent of the population, or 4.4 million individuals are currently living with a disability. [161] While this represents a significant proportion of Australia's population, there has been a significant lack of research and understanding regarding the impacts of COVID and long-COVID, and complications in people with disabilities. It is also important to state that disability and health status cannot be inflated, rather there must be a naming and description of the systems and structures that create vulnerability and negatively impact the health of people with disabilities. [162] This lack of understanding and appropriate care is exacerbated for individuals with 'invisible illnesses' who don't meet traditional, and often inappropriate, checklist criteria for disability support. [163] These barriers are not new to the current pandemic, having existed in the health space since well before, and include inaccessible services, lack of appropriate transportation, high out-of-pocket expenses, and stigma and discrimination from healthcare workers. [164] For individuals living with disabilities and chronic health conditions, the impacts of pandemics and epidemics can be understood as direct from the virus itself, and indirect from systems and structures involved in the provision of healthcare and protective measures. [165] Structural vulnerabilities, previously unexamined in the wider healthcare and social systems, were often rendered visible during the pandemic, where government support for healthcare and disability support care were lacking, bringing into focus the existing deficits in systems intended to provide care and support. [166]

During pandemics and epidemics, changes to healthcare services, including the diversion of staff and facility changes, disproportionately affected people with disabilities who have higher health needs. Of particular note during the ongoing COVID-19 pandemic, was changes to healthcare and disability services normally provided through schools, which closed during the pandemic, affecting access to these services. [164] Australian research found that half (42.2%) of study participants reported missed or delayed access to health care due to COVID-19, people with disabilities or high psychological distress were twice as likely to report worse health as a result of missed or delayed care. [167] Among the specific health services that were missed or delayed, dental services were the most commonly reported (26.1%), followed by visits to a general practitioner (16.3%) and specialists (12.6%). [167] The 2020 People with Disability and COVID-19 Report from People with Disability Half experienced significant decreases in the provision of disability support during the pandemic. [8] While there was an increase in the access to telehealth services which was well received, respondents noted significant difficulty in healthcare access prior to the pandemic, and existing barriers to telehealth access during the pandemic, especially for individuals who were deaf or had communication difficulties. In addition, 91% of people with disabilities surveyed reported increased expenses during the pandemic, often as a result of change to public facility service provision, forcing individuals to pay significant fees for privately provided healthcare services. [161,168]

Of concern and related to the inherent ableism in our society, is the individual responsibilisation for health safety, especially imposed upon individuals who are disabled and chronically ill and must go out to attend work, connect with their communities, and participate in their lives fully. [162,166] In disregarding the best health advice at the time, the decision to remove mandated protective measures during the COVID-19 pandemic, including masks, and self isolation and testing requirements, signalled that the government was more concerned with economic productivity and a return to 'normal' working conditions, than the health of the community. [169] Rather than acting in the best health interests of the community, the government instead doubled down on the discourse of individual responsibility, thereby increasing the vulnerability of individuals living with disabilities and chronic illnesses. Government messaging in the US, UK and Australia during the ongoing COVID-19 pandemic demonstrates this explicitly by calling for individuals in 'high-risk' or 'vulnerable' population groups to isolate themselves, demonstrate greater care and stay safe, transposing. [166] This messaging and process transfers responsibility from the state to the individual, constructing and perpetuating a discourse of vulnerability as a characteristic of individuals, negating the structural and multifactorial barriers to safety, and lack of access to safe and appropriate for people with disabilities and chronic illnesses. [170,171] This process was

exemplified and amplified by the increasing financial pressures involved in difficult decisions to maintain employment, in a climate of increasing living costs, and the individual pressure imposed to risk one's health for financial reasons in the absence of adequate government and financial support. [165]

The systematic exclusion of disabled perspectives has allowed ableist policies and social norms to go unchecked and unchallenged, demonstrating the longstanding pattern of ableist social norms, policy and behaviour that permeate our society and impact individuals living with disabilities and chronic illnesses. [162] COVID-19 specific preventative and response measures were often not designed with disability inclusion in mind. People with disabilities are at higher risk of morbidity and mortality from COVID-19, yet their access and communication needs were neglected. Information about COVID-19 and preventive strategies were not often available in accessible formats, and measures like social distancing and mask-wearing did not always consider the needs of people with disabilities. [164] With rare exceptions, national and regional health systems did not consider the needs of disabled people when deciding the best strategy to combat the pandemic outbreak. [166]

The operation and nature of health and social systems have long been significant sources of trauma and grief for people with disabilities and chronic illnesses. This trauma and grief has been exacerbated by the current pandemic, stemming from the understanding of historical patterns of devaluation and eugenics which have defined previous health emergencies and tragedies. [162] Significantly contributing to this trauma and grief, and fears of repeated patterns of devaluation, is the reality that access to routine healthcare and disability support services are adversely affected during pandemics and epidemics, especially for conditions that are not able to be managed using telehealth or remote healthcare services. [172] When access to healthcare is physically possible, interactions with others, including healthcare workers carries with it significant risk of infection, even when interacting with asymptomatic individuals. [173] Well founded fear of contracting further illnesses, especially COVID-19 is a significant factor influencing health-seeking behaviours in individuals with disabilities, especially in relation to hospital facilities. [164]

These fears, and the trauma and grief that they impose, are inherently linked to the ideology of individual responsibilisation of healthcare in the western world, typified by the ableist necropolitics of an anti-mask movement that prioritises personal preference over the safety and survival of all members of the community. [166,170,171] Understanding this reality for people with disabilities and chronic illnesses also requires an examination of the conditions society and its systems deem suitable and appropriate for individuals living with disabilities and chronic

illnesses. Living conditions, especially for people with intellectual disability in congregate housing, including nursing homes, institutions and group homes, where workers are coming and going make social isolation impossible. When combined with limited COVID-19 tracking, these environments increase the ongoing stress and grief experienced by people with disabilities because of structures beyond their control. [162] More than just concern for their own health and wellbeing, individuals with disabilities and chronic illness are concerned with the potential suffering and death of family, friends, colleagues, mentors and other members of the community with disabilities. In each of these specific points of constructed vulnerability, the disability community had well founded fears that have been borne out in reality during the ongoing COVID-19 pandemic.

More so, societal attitudes driven by ableism and neoliberal assumptions of economic participation and productivity permeate society, shaping decision making frameworks, and unless explicitly ruled out in guidelines, may shape decision making frameworks in the future. Examples of the inappropriateness of frameworks include the UK NICE COVID-19 Rapid Guidance, which recommended prioritising critical care based on the Clinical Frailty Scale. [174] Quickly identified as ableist, disability advocates pointed out that the scale designed as a tool for elderly people, would also characterise younger people with disabilities who require care with daily activities as inappropriate for care, despite being in otherwise good health and having a similar prognosis to other people their age. [175] It is within this decision making context that people with disabilities and disability rights experts should be embedded in decision making entities, to ensure the continued representation of their voices and perspectives, addressing their specific needs and concerns and working to address their ongoing fear, trauma and grief. [176]

The ongoing COVID-19 pandemic has borne out these fears most starkly in the allocation of resources, based on assumptions of health, quality of life and social utility. It is important to ensure that disability is not conflated with health status, whilst simultaneously recognising that many individuals with disabilities also have health conditions that may put them at higher risk of severe complications or death if they contract COVID-19. [162,175] Decisions about quality of life in resource allocation frameworks in an overwhelmingly disablist society use predicted quality of life to justify significant and unjust bias against people with disabilities. [175] Significant literature demonstrates robust empirical evidence of the wide chasm between non-disabled people's evaluation of the quality of life with disability, and disabled people's own evaluation of their quality of life. [177,178] While no explicit evidence exists demonstrating social utility assumptions directly driving COVID-19 pandemic decisions, historic examples do exist.

Prevention and Preparedness

The WHO defines global pandemic preparedness as a 'continuous process of planning, exercising, revising and translating into action national and sub-national pandemic preparedness and response plans.' [14] There has been a global shift in pandemic preparedness following the COVID-19 pandemic, pushing it to the forefront of many public health physicians mindsets, which has correlated with a recent push to have a mode of transmission based focus for preparedness. This involves a more generalised approach that enables preparation for a wider range of possible pathogen outbreaks. [16]

One Health

Described by the World Health Organisation as an "integrated, unifying approach to balance and optimise the health of people, animals and the environment… One Health is a collaborative, multisectoral, and transdisciplinary approach - working at the local, regional, national, and global levels - with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment. [14] This one health focus hence works on improving the health of not only humans, but also on the health of animals and plants, as the interconnection between these aspects of the ecosystem is a driving force in disease epidemics of zoonotic origin.

Examples of failures to adequately address and implement the One Health principles are evident around the world. In Malaysia, the loss of natural habitat has increased human encroachment into rainforests traditionally reserved for macaque monkeys. This interaction between humans and monkeys has facilitated a new form of zoonotic malaria, Plasmodium Knowlesi, causing an eruption of infection in Malaysia. [15] In addition, climate change has enabled changes in habitat that enable vectors like mosquitos and ticks to spread to areas previously free of them. This has contributed to the spread of dengue outbreaks down into more southern aspects of Australia as the Aedes Aegypti habitat has grown. [16]

Anthropogenic climate change is widely regarded as the single greatest threat to the continued human existence on earth and the preservation of the planet. [77] There is global scientific consensus that a global temperature rise of more than 1.5℃ from pre-industrial levels would be catastrophic for the global ecosystem and society, resulting in immeasurable health impacts and death. [78] Climate change poses these risks as it exacerbates the spread and impact of existing and novel infectious diseases and vectors, including malaria, dengue fever, and Lyme disease, expanding the geographic impact of these into new domains of human contact. [79] More than this, diseases and illnesses of zoonotic origin pose a significant threat to global health security and will continue to increase in prevalence as global habitat and

migratory patterns shift with the changing climate. [80] Another issue of note during pandemics and epidemics is the overuse of antibiotics. This was seen in the Covid pandemic where patients with Covid were unnecessarily started on extensive broad range antibiotics when there was no significant clinical or investigation signs suggesting a bacterial colonisation. This works to create a selective pressure which helps create an increase in microbial resistance to antibiotics, leaving us more vulnerable to infections and epidemics in the future. [145]

The ongoing spread of humans into natural animal habitats thus necessitates greater care and caution by adopting a holistic approach to health and the environment encompassing human and animal health and interaction, preventing the further spread and outbreak of emerging pathogens from zoonotic sources. With climate change such a strong driving factor for these health dilemmas, there is a pressing need for medical students to be exposed to a curriculum that includes education about the pathophysiology underpinning climate-related illnesses, the increased burden of vector-borne & infectious diseases due to climate change, and the human driven causes of climate change and disease. Currently, there has been a lack of implementation of “climate science” to the “traditional” medical school curriculum. [109-110] Thus it is of utmost importance that future healthcare providers are trained to recognise these clinical challenges, implement holistic patient care and to be informed enough to contribute to advocacy for change in the climate change scene.

Health Systems, Collaboration and Cooperation

Health surveillance involves having health systems set up to have rapid response to novel outbreaks of conditions, and where cases are rapidly detected. This can be achieved through education of epidemic response to healthcare practitioners and overall strengthening of healthcare systems There are three key benefits of health surveillance systems. These include acting as an early warning system for impending outbreaks that could become public health emergencies; enables monitoring and evaluation of the impact of an intervention, helping to track progress towards specific goals; and monitors and clarifies the epidemiology of health problems, guiding priority-setting and planning as well as evaluation of public health policy and strategies. [13]

The WHO advocates for improved interconnectivity and this includes building equitable systems; conducting joint exercises; and sharing information on good practices, challenges, and opportunities. Dedicated sustained investments, financing and monitoring of pandemic preparedness with a particular focus on addressing the gaps identified during past pandemics and epidemics will also help reduce incidence of pandemics, which benefits all countries. [14]

A third tennant in global pandemic preparedness is raising the quality of healthcare systems worldwide, which enables both improved detection and rapid response to outbreaks, but also helps create dynamic health systems and workforces that can respond and adapt the needs of communities as different health challenges appear. [15] There are a wide range of methods to strengthen health systems, but universal health coverage is a key tennant in sustainably mitigating outbreaks, and robust primary health care is useful in equitably and efficiently safeguarding communities from future health threats. [15]

Equity of access to Vaccines

Vaccine nationalism occurs when governments sign agreements with pharmaceutical manufacturers to supply their own populations with vaccines ahead of them becoming available for other countries. [146] During COVID, a rise in vaccine nationalism prompted calls for new approaches to achieve equitable access and justice not only for vaccines but also for vaccination. This includes ensuring country and community participation in global discussions regarding the supply and distribution. [16] Additionally, the local needs to strengthen health systems, address issues related to social determinants of health, build trust and leverage acceptance of vaccines, must be addressed. Regional vaccine technology and manufacturing hubs are promising approaches to address access challenges and must be integrated with efforts to ensure demand.

Despite the benefits to the health of the globe as a whole from improved equity in access to vaccines, the Covid-19 pandemic illustrated a key case study in vaccine inequity. Prior to vaccines becoming available and production stepping up globally, there were a range of initiatives like COVAX to ensure an equitable distribution of vaccines. However, despite a number of countries signing up to this, they were simultaneously undermining these efforts through politicising vaccine shipments through bilateral and multilateral deals that sequestered vaccine supplies to wealthy developed countries. [17] This inequity of supply is evidenced in Africa receiving only 10% of the initial Covid vaccines that they should have received if vaccine distribution was done according to population size. [18] This illustrates how despite initial attempts to improve equity, vaccine nationalism by rich developed countries still managed to undermine this initiative. Hence, greater efforts need to be made to create enforceable institutions that ensure equity is maintained in future crises. This could be achieved through supporting existing organisations like GAVI the vaccine alliance, which is a leading organisation that advocates and supports wider and more equitable access to vaccines worldwide. [19]

Another important issue is maintaining access to regular vaccinations throughout the health crisis. When supply chains are disrupted and health resources are focussed on a crisis often regular vaccines are forgotten, enabling other outbreaks to arise. Therefore, there needs to be a concerted effort to create resilient supply chains and health systems that are able to ensure a continued supply of vaccines. [20]

Public Perception and Preparedness

A cross-sectional study of the Australian public's perception of the COVID-19 pandemic and their associated health protective behaviours was performed in 2020. [167] This study explored how worry was a key predictor in a person's engagement in health protective behaviours and vaccination intentions. Another study also found that improved trust in government and a higher perception of effectiveness of interventions was key in improving their uptake.[168] From these studies, it can be seen that effective mass communication that focuses on improving public understanding of the disease causing an epidemic or pandemic could make major inroads in preventing spread of infectious outbreaks and reducing the burden of disease.

Health Infrastructure

Health infrastructure relates to all physical infrastructure, non-medical equipment, transport and technology infrastructure required for effective delivery of health services to ensure the highest level and most equitable access to healthcare. [22] The Australian health system is a complex mix of service providers and other health professionals from a variety of organisations. State and territory governments broadly share responsibility for operating and funding the health system. [23] Medicare is the national health insurance scheme and guarantees all Australians and some overseas visitors access to a wide range of health and hospital services at low or no cost. [24]

Challenges faced during the pandemic

The COVID-19 pandemic placed immense pressure on the Australian health system and as a result gave rise to many challenges to overcome. A major problem that was faced relates to discontinuity in healthcare delivery to those with on-going medical conditions. A survey assessing access to healthcare by middle-aged and old Australians during the COVID-19 pandemic revealed that almost 42% of respondents had missed or delayed access to health care appointments due to the pandemic. [25]Furthermore, as a result of restrictions on elective surgery introduced in early 2020, there were significant delays and increased waiting times for these procedures. [26]The delay in routine care meant reduced monitoring which ultimately led to the exacerbation of pre-existing conditions in many. [27] Notably,

the healthcare system responded to this by increasing the usage of Telehealth appointments to achieve some continuity in care until restrictions were eased which helped with monitoring chronic conditions but still had little effect on procedural-related treatment. [28]

Yet another challenge relates to communication with and within the healthcare system. During a pandemic, the healthcare system and federal government must work closely to inform the public of the threat of the virus and what steps to take as a population to mitigate the spread. However, miscommunication coupled with delayed responses led to slow implementation of restrictions to curb the virus. Evidence and healthcare professionals highlighted the importance of 'flattening the curve' to prevent intensive care units from overwhelming and to cope with limited supply of ventilators and other equipment. However, it was not until the end of March 2020 when more severe restrictions were put in place. Thus the need for efficient communication between important parties is essential in a successful pandemic response.

Personal Protective Equipment (PPE) is an important part in the solution of mitigating risk of infection in healthcare workers (HCW). However, shortages in PPE are common in a pandemic setting. During the COVID-19 pandemic, frontline HCWs were believed to represent up to 15% of cases in some countries, largely attributable to inadequate PPE. [29] Given the scarcity of resources, fair and equitable distribution of PPE to HCWs is essential. During the COVID-19 pandemic, to ensure PPE availability for surge capacity, the Australian government relied on a combination of both local industry and international suppliers to increase the National Medical Stockpile. [30] However, with concerns expressed over market volatility, manipulation and time-lag associated with global PPE supply chains, reduced reliance on international supply lines may prove to be an effective risk mitigation strategy for future pandemics. [31] This could be achieved through faster and more efficient mobilisation of local production with government incentives, expansion of PPE stockpiling and/or reconsideration of stockpiling system plans and distribution networks perhaps through developing emergency response plans, regular monitoring and reporting of stock as well as effective communication between between distributors and hospitals

The pressure on HCWs from the COVID-19 pandemic led to an increase in burnout and distress. [32] One strategy optimised to combat this during the pandemic was allowing final year medical students to supplement the existing junior doctor workforce through an Assistant in Medicine (AiM) role. [33] The AiM role was established as an opt-in position, for final year medical students in NSW, receiving 75% of NSW Medical Intern Salary. While this alleviated financial stressors of

unemployment for many students and gave them more clinical hands-on experience, there were a number of shortcomings. For instance, many students reported an increased difficulty balancing study and work highlighting issues within the rostering. [27]

While the COVID-19 vaccination rollout has been partly effective, it is important to recognise the challenges faced during the pandemic. The planning for the rollout was not timely as detailed planning with states and territories were not completed before the rollout commenced and the complexity of administering in-reach services to the aged care and disability sectors was underestimated. Thus leading to delayed commencement of vaccination programs. [34] Notably, the vaccine rollout to the residential aged care and disability sectors was slower than planned and as of 2021, the national target for vaccination rates in Aboriginal and Torres Strait Islander populations had not been met.

Healthcare Responses

Primary Care in Pandemics

The future of pandemic preparedness relies in the hands of primary care and can be facilitated by improving communication with family physicians. Primary care workers are responsible for early identification and diagnosis of disease, reporting cases, strengthening compliance, implementing prevention and protection measures, protecting vulnerable populations, promoting knowledge of the disease, and reducing the burden on hospital infrastructures. [38] Perspectives from Family physicians need to be better taken into account at the policy level in a collaborative manner to help direct policies that improve patient outcomes. [38] Health care systems should also prioritise community based primary care where physicians are provided with opportunities to step outside of their offices and provide patient-centred care in the community. [39] Primary care physicians have valuable insights into vulnerable populations as they build long-term relationships with their patients. Lastly, it is important to preserve primary care workforce capacity to ensure physicians are not overworked and that patient-care standards are maintained throughout the country. [40]

Public Health and Primary Care Collaboration

The Australian government and public health sectors are responsible for the implementation of the pandemic framework and infection control during the COVID-19 pandemic. [41] Interprofessional collaboration among public health departments and primary care teams improves pandemic preparedness. Public health sectors synthesise large sets of data and patterns to suggest healthcare interventions to effectively manage pandemics which can be implemented and practised by

physicians. [40] Therefore the collaboration between these two fields could help provide an improved response to the public needs and an overall organisational structure. [39]

Telehealth

The emergence of Artificial intelligence (AI) has been transformative in many fields due to its capacity to synthesise large, inclusive and historical data in real-time while informing on data-driven and evidence-based decision-making capabilities. [42] The incorporation of AI into public health and the global health system can significantly decrease the burden of disease, and pandemic-related mortality in the future. [42] The digitization and rapid relay of information in China through applications such as 'WeChat' helped with contact tracing, informed residents on the incidence of diseases, and covid-related deaths in the area, and disseminated information regarding wearing personal protective equipment (PPE), handwashing and limiting social gatherings. [39]]

Telemedicine underwent an exponential growth during the covid-19 pandemic as healthcare providers offered primary care and mental health services virtually. [43] Practitioners and patients adapted quickly to the new modes of communication and the response has been alarmingly positive to invest additional resources in order to improve the quality of telemedicine as a permanent feature in primary health care settings. [44] However, healthcare workers who delivered telemedicine services reported loss of personal interactions and relationships with their patients. [45] Physicians and patients overcome this challenge by implementing telehealth services for health screening and management of non-communicable diseases. [43] Telehealth was reviewed as a beneficial integration into medicare by the Australian government as it closes the gaps for rural Australians accessing healthcare. [43] Thus the Commonwealth government expanded their Medical Benefit Scheme (MBS) to include telehealth services and virtual consultations as a permanent feature under Medicare. [45] As of 2021, the Morrison Government released a statement indicating an investment of $106 million over 4 years to fund telehealth for Australians. Approximately $32 million of the total investment is dedicated towards the workplace incentive program which encourages general practitioners to incorporate telehealth services to their patients under Medicare. [42]

The permanent Telehealth model offers mental health and chronic disease management services while offering rebates for medicare holders. Telehealth is covered by Medicare for phone call consultations for a maximum duration of 20 minutes or a video conference consult ranging from 20-40 minutes.[46] In 2023, Royal Association College of General Physicians (RACGP), called for increased funding for telehealth to offer rebates for virtual consultations that run for longer

than the standard 20 minute durations. [44] Telehealth plays a crucial role in chronic disease management especially for vulnerable populations such as those who are immunocompromised, have limited mobility, rurally located, of Aboriginal, Torres Strait Islander origin, or the aged population. [47] These groups may have limited access to video conferencing. Therefore, increased funding for telehealth can help with the long-term health of many patients. [44]

Contact tracing

The COVID-19 pandemic highlighted the limitations of traditional contact tracing methods, particularly in their ability to track large-scale movement and identify potential exposures quickly. While Australia's COVIDSafe app aimed to address these limitations, its effectiveness was hampered by low uptake due to privacy concerns and limited functionality.

Unlike traditional methods relying on physical proximity, digital tracing apps can track contacts real-time across large geographic areas, potentially identifying exposures missed by manual tracing. [48] This facilitates earlier isolation, thereby, reducing transmission and containing the spread of the disease. Alternative approaches, such as location-based tracking instead of individual identifiers, can improve anonymity and potentially address privacy concerns that hampered COVIDSafe's adoption. [49] This shift could encourage greater participation and enhance the effectiveness of digital tracing. For instance, South Korea's early and high levels of uptake of COVID-19 contact tracing apps was in part due to greater focus being placed on location tracing over individual exposure tracing. This helped to minimise the spread of the COVID-19 virus in the early period of the pandemic. [50] Such apps also propagate health protective behaviours such as avoiding crowds, and avoiding travel.

The potential for government surveillance and data leaks associated with digital tracing apps remains a significant hurdle. Building trust and transparency through robust data protection measures and clear communication is crucial for wider acceptance in order for Australians to increase their uptake of such tracing apps in times of pandemics. [50] While digital tracing can complement traditional methods, it should not be seen as a replacement. Factors like app functionality, low smartphone penetration in rural areas, and digital literacy gaps can limit its effectiveness in the elderly population.

Diagnostic testing

In the face of pandemic threats, Australia must bolster its diagnostic testing infrastructure to enhance public health preparedness. This involves early expansion of laboratory facilities, equipment, and personnel training to ensure ample capacity for surge testing during outbreaks. [36] Additionally, the deployment of rapid point-of-care tests (POCTs) and high-throughput platforms will improve testing

accessibility and efficiency, aiding in swift case identification and isolation. International collaboration is essential, as it allows for the sharing of research findings and resources related to diagnostic testing. [36] By engaging with global partners, Australia can benefit from knowledge exchange and expedite the development of effective testing tools, thereby enhancing readiness for future outbreaks. Furthermore, establishing a national pandemic policy to address jurisdictional inconsistencies in diagnostic requirements is crucial. Standardising protocols and procedures will facilitate the rapid deployment of POCTs across various healthcare settings, ensuring equitable access to testing nationwide. This streamlined approach will bolster the efficiency and effectiveness of Australia's testing response during pandemics. By prioritising these initiatives, Australia can build a robust diagnostic testing infrastructure that serves as a cornerstone of its pandemic preparedness strategy. This investment will not only safeguard public health but also enable a swift and effective response to future outbreaks, minimising their impact on both health and economic well-being.

Personal Protective Equipment (PPE)

In epidemics and pandemics, frontline HCWs are often at elevated risk of infection and death due to close and prolong DC ed contact with infectious patients and co-workers [165,166]. Both the physical and mental burdens of being a frontline HCW decrease the capacity of HCWs to provide quality care for patients [167]. Furthermore, infection of HCWs causes further workforce depletion and places increasing pressure and burden on remaining staff [167].

Personal protective equipment (PPE) is an important part of the solution in mitigating risk of infection for HCWs. However, shortages to PPE are common during epidemics and pandemics [168]. During the COVID-19 pandemic, frontline HCWs were believed to represent up to 15% of cases in some countries, largely attributable to inadequate PPE [169]. Given the scarcity of resources, fair and equitable distribution of PPE to HCWs is essential. This can be achieved through transparent and well-defined guidelines that prevent stigmatisation of necessary PPE use and minimise unnecessary overuse[170]. These measures would be particularly beneficial in the context of rural and remote communities, with many rural HCWs during the COVID-19 pandemic expressing concerns over the lack of a centralised system of PPE distribution [171].

During the COVID-19 pandemic, to ensure PPE availability for surge capacity, the Australian government relied on a combination of both local industry and international suppliers to increase the National Medical Stockpile [172]. However, with concerns expressed over market volatility, manipulation and time-lag associated with global PPE supply chains, reduced reliance on international supply

lines may prove to be an effective risk mitigation strategy for future pandemics [173-175]. This could be achieved through faster and more efficient mobilisation of local production with government incentives, expansion of PPE stockpiling and/or reconsideration of stockpiling system plans and distribution networks [176].

Whole of Government Responses

Financial and Employment Support

One key social determinant was financial insecurity, with young Australians (aged 15 to 24) making up 55% of job losses despite only constituting 14% of the population in Australia. [51] For medical students, with an already high level of commitment required for their course, coupled with limited ability and opportunity to support themselves, there is a disproportionately large risk of burnout and psychological distress. [51]

To mitigate this crisis, the Australian government implemented and increased several financial incentives, including the JobSeeker, JobKeeper and other income support payments. While these measures undoubtedly provided immediate financial relief, their long-term limitations necessitate a re-evaluation of youth-targeted economic policies. [52] The JobSeeker payment, significantly increased during the pandemic, served as a crucial safety net for young Australians facing job losses. The 2020 COVID-19 supplement payment of $550 per fortnight was beneficial, potentially mitigating financial hardship and helping to foster a sense of security during uncertain times. [53] Studies suggest a positive correlation between increased income from government support and improved mental health outcomes particularly reduced anxiety and depression, and lowered suicide rates. [53] However, the temporary nature of the supplement and the eventual reduction in JobSeeker payments raise concerns about long-term financial insecurity and its potential negative impact on mental well-being. Additionally, eligibility criteria, income-testing, the constantly evolving nature of such financial benefits may have left out some vulnerable young people, reducing the effectiveness of these programs.

A more comprehensive approach is needed to address the systemic issues underlying youth unemployment. Increased and sustained stimulus spending targeted towards youth-specific initiatives could offer a more robust solution. [52] In addition, improving the protection of Casual workers by including paid sick leave could ensure that they remain protected whilst experiencing the pandemic illness. Additionally, universities can offer jobs counselling and offer job recruitment for university students, to improve financial stability in the long term. Another key consideration would be the provision of increased rental assistance as a form of

income support given that more than 30% of income expenditure arises from housing costs. [51] They can also expand mental health support services specifically designed for young people experiencing unemployment to address the psychological burden associated with job insecurity.

Food insecurity

Another integral element to a student's mental health is food security. The impact of food insecurity among medical students' mental health during the COVID-19 pandemic cannot be overstated. Food security, defined as the sustainable and economic access to safe and nutritious foods, is a cornerstone of overall well-being. [54] Conversely, food insecurity, characterised by inadequate access to food, is intricately linked to a myriad of mental and physical health concerns, such as depression, anxiety, and sleep disruption that can adversely impact academic performance. [51,54,55] Limited financial resources, the demanding time commitments inherent to medical education, and the ease of accessibility towards highly processed foods contributes towards food insecurity amongst medical students. [55] These challenges were further compounded by the onset of the COVID-19 pandemic, during which stringent restrictions and lockdown measures were imposed, with Victoria arguably enduring the most stringent of such protocols. For students, especially those living independently, the isolation and limitations imposed by these measures precipitated a surge in negative mental and emotional health outcomes. [55,56]

Furthermore, the impact of food insecurity is not uniform across all segments of the student population. International students in Australia, are disproportionately affected by food insecurity, lacking the familial support networks that local students may rely upon for sustenance. [55] While universities have sought to mitigate these challenges through initiatives such as food banks and vouchers, such measures are inherently limited in their efficacy and sustainability, in part due to the lack of culturally suitable foods, and students not being able to physically access the food vouchers and meals.

In order to target food insecurity experienced by students, universities, in conjunction with governmental bodies, must prioritise the implementation of sustainable interventions aimed at bolstering financial stability, an underpinning pillar of food security. Additional measures include enhancing physical access to nutritious foods at campus facilities during lockdowns, and enhancing accessibility to mental health services through telehealth. [55] By fostering an environment conducive to food security, we can ensure that medical students are equipped to thrive academically, physically, and mentally.

Mental Distress in Students

The COVID-19 pandemic significantly impacted the level of mental distress of students worldwide, and Australia was no exception. While the academic and clinical pressures inherent to study already contribute to mental health challenges, the pandemic introduced additional stressors, further exacerbating existing vulnerabilities.

The COVID-19 pandemic has meant that many, including highschoolers have been forced to study at home due to school closures as an effort to reduce the spread of COVID-19. This has left many vulnerable, disconnected and socially isolated through an extended period of time. [126] As such, this has led to the exacerbation of feelings such as anxiety, uncertainty and loneliness, leading to affective and behavioural problems, presenting potential problems in the long term of the health and wellbeing of our younger generations. [128] Such data may inform us of possible future measures that can be undertaken to reduce the effects of such mental health problems by increasing measures that address the root cause of mental distress. This includes a greater focus on the domestic situations of children as a factor that can instead be harnessed to improve, rather than worsen the mental health of adolescents in high school due to the increased risk of family stress or abuse. [129-133]

Financial Impacts and Mental Distress

Despite the main goal of this policy update being to shift the focus away from just COVID-19, it is very important to analyse its financial impacts on the Australian population and the role this strain plays in the development of mental distress. Being the most recent pandemic, it provides the most relevant insight into how future pandemics will impact populations economically. As governments implemented various public health measures to minimise the spread of disease such as lockdowns and social distancing protocols, the resulting economic downturn has had significant and multifaceted financial repercussions on the general population. Here, the challenges each individual and household faced and the coping strategies adopted during this unprecedented crisis will be explored.

One of the most immediate and widespread consequences of the pandemic in Australia has been the loss of jobs and income for millions of people. Public health measures such as lockdowns led to widespread layoffs and many Australians faced sudden unemployment or significant reductions in working hours across various industries, especially those heavily reliant on in-person activities such as retail, hospitality and tourism. [128] The onset of the pandemic saw the largest increase in job insecurity in the past 20 years. Around 1 in 20 workers reported losing their jobs and almost 10% of Australian workers were stood down without pay. [132] Over 30%

of Australians reported a reduction to their personal income, with 19% saying their income was reduced a lot. [133]

As a result of this loss or decrease to income, there was also a strain on personal finances housing-related finances were also a challenge for many where 11.2% of Australian renters asked to suspend rent payments and 11.3% attempted to suspend mortgage payments. [132] Overall, 53% of Australians cut down on spending on non-essential items and 25% cut down on spending on essential items. There were also 11% that applied for early access to superannuation to alleviate their financial stresses. [134]

The financial impacts of COVID-19 have widened existing economic inequalities. Vulnerable populations, including low-wage workers, minority communities, and individuals with precarious employment contracts, were disproportionately affected. They faced higher rates of job loss and financial hardship compared to more affluent counterparts, widening the gap between the wealthy and economically disadvantaged segments of society. It was established that socio-economically disadvantaged groups were more vulnerable with low-income jobs that were less likely to be executed from home, so they are most affected by the lockdown and social distancing measures. [133] Supporting this, a study among people across the European Union in the first months of the pandemic also showed high job insecurity amongst workers with non-permanent contracts. [134]

The financial repercussions of COVID-19 in Australia extends beyond monetary concerns. It can also significantly impact an individual's mental health. Job insecurity, mounting debt and uncertainty about the future all seemed to contribute to declining psychological well-being amongst Australians. Pre-existing studies have shown that inadequate income is a major contributor to poor mental health and that unemployment increases the risk of psychological distress and depression. [136] A more recent grim study has unfortunately linked the increase in unemployment during COVID-19 with an increase in suicide rates. [137] Combined with the lack of autonomy and control of one's financial decisions, the connection between financial stress and mental health decline is made even stronger under the perilous economic situation so many people are placed under during pandemics and epidemics.

The Australian government implemented various fiscal measures to support individuals and businesses, including JobKeeper and JobSeeker payments along with small business grants and mortgage relief programs. These income support packages have been shown to alleviate poverty and minimise the income drop that many experienced. [138] This is supported by another study that highlights the

importance of safeguarding financial security for financially vulnerable households in crises. [139] Another study has also found that adequate welfare benefits are central to lowering suicide rates in times of economic hardship during pandemics and epidemics. [139]

It is within this context that the Australian government at the time asserted that a 'shadow pandemic' of mental distress would be hidden underneath the more obvious COVID-19 health emergency. [130,141,142] Analysis of government and health messaging during the pandemic revealed the increasing individual responsibilisation for mental distress as a result of financial difficulties, constructing a narrative that made it impossible to adequately recognise and attribute blame to consistent government financial support failures. [130] At the time, it was suggested that recognition of these failures would provide an opportunity to remake 'the social contract', alleviating individual blame and burden for mental distress, but this has failed to eventuate on account of inadequate reconceptualisation of the root causes of mental distress. [130, 143, 144]

Education and Learning

The shift towards online learning, propelled by the COVID-19 pandemic, has brought both advancements and challenges for medical students and their mental health in Australia. While travel restrictions, lockdowns and the cancellation of clinical placements threatened to harm the academic progress of medical students, online learning has helped to maintain educational continuity while minimising the risk of COVID-19 transmission among students, faculty, and the broader community. [61] Moreover, online platforms allowed for asynchronous learning, enabling students to access materials and complete coursework at their own pace, potentially balancing studies with personal needs. [62] Online learning elevated the student experience for international students, many of whom were faced with the inability to enter Australia due to travel restrictions or having to self-isolate upon return. The ability to access lesson material unhindered by time or space restrictions enriched student experience. [62]

The transition to online learning had its own implications however, with the absence of hand-on training like procedural skills being a significant concern for medical students across Australia. Medical students expressed concerns regarding readiness for clinical practice and confidence levels, with procedural skills proficiency levels found to be lower when compared to pre-pandemic levels. [63,64]

To combat this challenge, looking ahead, exploring emergent technologies such as artificial intelligence for adaptive learning and virtual simulation holds promise for enhancing medical education in the future. [63] These innovations have the potential

to bridge the gap in practical training and provide students with immersive learning experiences that mimic real-world scenarios. Another consideration would be adopting a hybrid model, one that offers a mix of face-to-teaching for essential clinical skills and online curricula for going through theoretical knowledge at students' own pace as mentioned in the Information Technology and Delivery of Medical Education (2023) policy. [65]

Another challenge of online learning is the rise of videoconferencing fatigue. The increased reliance on video conferencing platforms demands heightened attentiveness, with students grappling with issues such as interpreting body language and feeling constantly monitored during virtual interactions. [66] In addition, some face difficulties with self-discipline, motivation, or access to technology. [67,68] To combat this, the resumption of face-to-face classes as quickly as possible after pandemic restrictions are reduced, would help to optimise learning outcomes as hand-on experiences and social interaction remain crucial for medical students. [65,69,70]

Furthermore, pandemics result in an increased uncertainty around graduation timelines,especially for clinical year medical students. This could contribute towards academic stress, anxiety, and feelings of inadequacy, potentially exacerbating existing psychological burdens. [71]

However, universities can play a crucial role in alleviating this stress. Constant, transparent communication with students about updated plans, contingency measures, and available support systems can be a lifeline. Regular updates about graduation timelines and clear guidance on adapting to changing circumstances can foster a sense of control and reduce anxiety. By prioritising student well-being and proactively addressing their concerns, universities can help them navigate this period of uncertainty with greater resilience and mental stability.

Following Pandemics and Epidemics

Lessons from COVID-19

There were unequivocally lessons to be learnt from the COVID-19 pandemic. Consequently, there have been many developments in strategies to improve the national response to the pandemics and epidemics in the future. The pandemic initiated a change in Australia's goals and priorities making them more focused on strengthening global health systems by building on lessons learnt from the past and working towards these goals by collaborating with local and multilateral groups such as the World Health Organisation (WHO). [35] For instance, Australia is actively involved in the newly formed WHO intergovernmental negotiating body which aims to craft an international agreement on pandemic prevention, preparedness and

response. [35] Furthermore, agencies such as Commonwealth Scientific and Industrial Research Organisation (CSIRO) have released reports on how to strengthen Australia's pandemic preparedness through science and technology. [36] Communicating and collaborating with these agencies will help strengthen the health system on a whole.

Although entities such as the National and State/Territory Cabinets did respond and provide guidance to the previously newly emergent pandemic, it was limited by the "lack of timely national data". [57] Furthermore, the ability of states and territories to independently respond in the public health sector, these response efforts were inhibited by the lack of linked datasets, slow data flows, where it is clear that Australia's new national disease surveillance model must be greater catered towards enhancing the flow, communication and availability of data within and between states/territories. [59] As a consequence of the pandemic, there has been an emergence of new Australian organisations such as the Australian Institute of Infectious Diseases (AIID) and the Australian Centre of Disease Control (Australian CDC) which may aid with pandemic preparedness in the future.

A closer lens must be used to critically evaluate whether border closures and lockdowns minimised 'adverse impacts' along with maximising their ability to protect the nation of Australia. [57] Although early harsh measures to prevent the spread of COVID into Australia through the 'zero COVID' response were initially successful, such harsh restrictions posed greater problems as new COVID strains and higher rates of transmissibility led to these policies becoming unattainable, at the cost of interfering with Australia's global connectedness. [58]

Extreme disease mitigation measures designed to prevent the spread of COVID-19 through lockdowns, border closures, qurantines and rapid containment responses were incredibly successful during the early stages of the COVID-19 pandemic in Australia. As a result of these measures, Australia experienced one of the lowest COVID mortality rates in the world during this early period of extended measures, saving an estimated 60,000 lives. [125] In instituting these measures, Australia was able to weather significant delays to the vaccine rollout, ensuring that the benefits of vaccination would become available despite these delays. [34, 125].

A thorough analysis, involving significant community outreach and consultation can provide a method of reflection for Australia's response to such a pandemic can inform us of future measures that can be taken to limit the negative impacts felt previously. People's health and well-being were and continue to be heavily impacted by the pandemic and responses taken to minimise its effects. [57] In August 2023, the Australian government reached out to local communities and key stakeholders

to provide views and recommendations for new pandemic instruments and amendments for the International Health Regulations (2005) to improve the preparedness and response to future pandemics and other health emergencies [37] Equity and health system strengthening were some of the key themes raised. Submissions suggest strengthening domestic pandemic prevention and preparedness through routine surveillance, laboratory systems and health workforce. Ultimately, respondents urge that equity must be a central tenet of effective approaches to pandemic responses in the future including consideration of marginalised communities.

Consequences of post pandemic and epidemic illnesses

While preparedness and response during an emergent outbreak leading towards a pandemic and epidemic are key factors to consider, it is also important to acknowledge and combat the high likelihood of longer physiological effects on an individual often present within some pandemic and epidemic illnesses. One of our most recent pandemics, COVID-19 demonstrates a key example that can be used to spotlight the importance of a system established to target the consequences and effects of large-scale illnesses in the long term.

Fatigue, fever, difficulty breathing and shortness of breath are some of the many key symptoms and issues felt by post-COVID-19 patients today, where research suggests that 1 in 5 peoples ages 18 to 54 have at least one medical condition potentially due to COVID, with 65 and older have a likelihood of 1 in 4. [72] More commonly known as 'Long COVID,' some, but not all individuals who have experienced COVID-19 have had symptoms, often severe ones for more than a few weeks from the initial onset of the illness. There is no current single treatment or system put in place for those suffering from Long-COVID, limited data on these long-term effects and lingering symptoms of post COVID-19 recovery have left people confused and unable to carry on with their lives to the fullest of their abilities. [73–75] Special attention must be targeted towards patients with underlying comorbidities who are more likely to suffer from these longer symptoms . To provide more accurate guidelines for approaching this issue, further studies as well as a more in depth understanding of its pathophysiology are crucial. As such, greater focus must be placed by the government through research and awareness of the physiological effects post pandemic/epidemic illness to minimise its harm and effects on people in the long term. In the future, the post-effects of pandemic or epidemic illnesses may be minimised through solid and well-informed treatment plans with more research.

Not only from a physiological standpoint, these symptoms further isolate certain individuals from society post their illness, where online communities and support groups are established by members of society to connect those who experience

these symptoms. These measures help improve the lives of many individuals affected, and are key to preparing and understanding how to effectively assist in combating the longer effects through both a social and pathophysiological manner. [75,76]

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Policy Details:

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Patrick Rosengren (Lead Policy Author), Izabella Mancewicz, Akash Shanmugam, Martin Nguyen, Hemani Mahendra Raj, and Venkata Vanganur; with Ashley Molloy (National Policy Mentor), Brittany Suttie (Global Health Policy Officer), Jonathon Bolton (National Policy Officer), Harry Luu (National Policy Secretary).

Adopted, Council 2, 2020

Jasmine Davis, Elizabeth Hu, Ashraf Docrat, Nesha Gezer, Ariella Heffernan-Marks, Mark Ranasinghe, Owen Taylor-Williams, Isaac Wade, Daniel Yao, Guy Jeffery (Global Health Policy Officer), Travis Lines (National Policy Officer)