MJA
The Medical Journal of Australia

SUPPLEMENT

VicHealth®

3 May 2021 Volume 214 No 8 www.mja.com.au

Australia in 2030

What is our path to health for all?

Print Post Approved PP255003/00505

AMA Journal of the Australian Medical Association

AMPCo.
Australasian Medical Publishing Company

Australia in 2030: what is our path to health for all?

Coordinating Editors:
Dheepa Jeyapalan, Lewis Keane and Cara Büsst

This Supplement was sponsored by

VicHealth®

Citation: Backholer K, Baum F, Finlay S, et al. Australia in 2030: what is our path to health for all? *Med J Aust* 2021; 214 (8 Suppl): S1-S40; doi: 10.5694/mja2.51020

Contents

S5 Our path to health for all: Australia in 2030
Jane Shill, Cara Büsst, Kellie Horton, Kirstan Corben, Sandro Demaio

S7 1. How Australia improved health equity through action on the social determinants of health
Sharon Friel, Fran Baum, Sharon Goldfeld, Belinda Townsend, Cara Büsst, Lewis Keane

S12 2. Aboriginal and Torres Strait Islander connection to culture: building stronger individual and collective wellbeing
Summer M Finlay, Karla Canuto, Kootsy Canuto, Nadia Neal, Raymond W Lovett

S17 3. Physical determinants of health: healthy, liveable and sustainable communities
Billie Giles-Corti, Anthony Capon, Annemarie Wright, Patrick Harris, Anna Timperio, Andrew Butt, Melanie Lowe, Belen Zapata-Diomedi, Carmel Williams, Tahna Pettman, Lucy Gunn

S22 4. Health promotion in the Anthropocene: the ecological determinants of health
Rebecca Patrick, Fiona Armstrong, Anthony Capon, Kathryn Bowen, Selina N Lo, Aileen Thoms

S27 5. Disrupting the commercial determinants of health
Alexandra Jones, Jennifer Lacy-Nichols, Phil Baker, Anne Marie T Thow, Jane E Martin, Mike Daube, Kathryn Backholer, Belinda Townsend

S32 6. Digital determinants of health: the digital transformation
Kathryn Backholer, Jennifer Browne, Annemarie Wright, Robert Grenfell, Anna Peeters

S36 7. Governance for health and equity: a vision for our future
Fran Baum, Sharon Friel, Phil Baker, Kathryn Bowen, Cara Büsst

Our path to health for all: Australia in 2030

Jane Shill[1], Cara Büsst[1], Kellie Horton[1], Kirstan Corben[1], Sandro Demaio[1,2]

We currently have a once-in-a-generation opportunity to reimagine life and health in Australia. The global coronavirus pandemic has highlighted many public health issues, bringing public attention and a sense of priority to protecting and promoting wellbeing.

All Australians have the right to access the resources and environments necessary for a long and healthy life. Yet many in our community face multiple barriers to achieving good health and wellbeing. For example, we live in a country where:

- one in eight Australians, including one in six children, live in poverty and cannot afford necessities such as healthy food, clothing, education and health care;[1]
- inequitable access to supportive walking and cycling infrastructure, greenspace, community infrastructure and transport options limit opportunities to live a healthy and prosperous life;[2-4] and
- exposure to the marketing tactics of the alcohol, gambling and unhealthy food and drink industries negatively influences perceptions and behaviours across the life course.[5-8]

The pandemic has affected every Australian; however, research highlights that the impacts have occurred inequitably across the community. For example, in Victoria during the second wave of restrictions, one in four Victorians receiving JobSeeker or JobKeeper government payments experienced high psychological distress, compared with one in six people overall; and one in ten Victorians aged 18–24 years ran out of food and could not afford to buy more, compared with one in 20 people overall.[9]

Now is the time to rethink our vision for health and wellbeing, aiming for a state of *health for all*, where every Australian has equal opportunity to realise their full potential by 2030. For this vision to be realised, we need to accelerate action that focuses on the multiple, complex and often intersecting determinants of health, and harness opportunities that offer progressive policy and practice change.

The chapters in this supplement outline a post-pandemic pathway to health for all, focusing on issues and opportunities relating to the social, physical, cultural and commercial determinants of health as well as the increasingly recognised and understood fields pertaining to the ecological and digital determinants of health — all of which influence the environments in which we live, work, play, grow, learn and age.

Coordinated and sustained action is required across multiple sectors, settings and all levels of government if we are to truly address these determinants and make gains in improving the health and wellbeing of all Australians over the coming decade. Appropriate action will also undoubtedly result in co-benefit for planetary health, which remains one of the greatest human health concerns.[10]

This supplement explores some of the critical opportunities that we need to focus on now to improve the health and wellbeing of all Australians over the coming decade. Chapter 1 takes us on a journey to 2030 where the status quo has been challenged and replaced with progressive, committed and genuine action to address the social determinants of health. Chapter 2 challenges our understanding and acknowledgement of culture as a key determinant of Aboriginal and Torres Strait Islander health and wellbeing. A call for collaborative and urgent evidence-based action to address urban planning for both human and planetary health is made in Chapter 3. Chapter 4 explores the ecological determinants of health, presenting threats to and opportunities for public health and health promotion. The commercial determinants of health and options for countering the negative practices of the private sector are discussed in Chapter 5. In Chapter 6 we look at the implications of the digital revolution for public health. Finally, in Chapter 7 we again fast forward to 2030 where transformative change in governance has occurred to achieve health, sustainability and equity outcomes and, ultimately, a better Australia.

The supplement outlines a bold vision for the future of health and health promotion in Australia. A vision that will be vital for a healthy, equitable and prosperous Australia in the decade to come. A vision requiring brave, bold and effective leadership. The time to act is now. As you read through the chapters that make up this supplement, we challenge you to consider what you can do now to ensure health for all Australians by 2030.

Acknowledgements: This supplement was funded by the Victorian Health Promotion Foundation (VicHealth). VicHealth is a pioneer in health promotion. It was established by the Victorian Parliament as part of the *Tobacco Act 1987* and has a primary focus on promoting good health for all and preventing chronic disease.

Competing interests: No relevant disclosures.

Provenance: Commissioned; externally peer reviewed. ■

How to cite this editorial: Shill J, Büsst C, Horton K, et al. Our path to health for all: Australia in 2030. *Med J Aust* 2021; 214 (8 Suppl): S5-S6.

1 Davidson P, Bradbury B, Wong M. Poverty in Australia 2020: Part 2: Who is affected? ACOSS/UNSW Poverty and Inequality Partnership Report No. 4. Sydney: ACOSS, 2020. http://povertyandinequality.acoss.org.au/wp-content/uploads/2020/05/Poverty-in-Australia-2020-Part-2-%E2%80%93-Who-is-affected_Final.pdf (viewed Oct 2020).

2 Christian H, Zubrick SR, Foster S, et al. The influence of the neighborhood physical environment on early child health and development: a review and call for research. *Health Place* 2015; 33: 25–36.

3 Murphy M, Badland H, Jordan H, et al. Local food environments, suburban development, and BMI: a mixed methods study. *Int J Environ Res Public Health* 2018; 15: 1392.

4 Bentley R, Blakely T, Kavanagh A, et al. A longitudinal study examining changes in street connectivity, land use, and density of dwellings and walking for transport in Brisbane, Australia. *Environ Health Perspect* 2018; 126: 057003.

5 White V, Azar D, Faulkner A, et al. Adolescents' exposure to paid alcohol advertising on television and their alcohol use: exploring associations during a 13-year period. *Addiction* 2017; 112: 1742–1751.

6 Pitt H, Thomas SL, Bestman A, et al. Factors that influence children's gambling attitudes and consumption intentions: lessons for gambling

[1] Victorian Health Promotion Foundation, Melbourne, VIC. [2] University of Melbourne, Melbourne, VIC. jshill@vichealth.vic.gov.au • doi: 10.5694/mja2.51020

harm prevention research, policies and advocacy strategies. *Harm Reduct J* 2017; 14: 11.

7 Deans EG, Thomas SL, Derevensky J, et al. The influence of marketing on the sports betting attitudes and consumption behaviours of young men: implications for harm reduction and prevention strategies. *Harm Reduct J* 2017; 14: 5.

8 Boyland EJ, Nolan S, Kelly B, et al. Advertising as a cue to consume: a systematic review and meta-analysis of the effects of acute exposure to unhealthy food and nonalcoholic beverage advertising on intake in children and adults. *Am J Clin Nutr* 2016; 103: 519–533.

9 Victorian Health Promotion Foundation. VicHealth coronavirus wellbeing impact study: follow-up survey. Melbourne: VHPF, 2020. https://www.vichealth.vic.gov.au/media-and-resources/publications/vichealth-coronavirus-victorian-wellbeing-impact-study-follow-up-survey# (viewed Feb 2021).

10 Whitmee S, Haines A, Beyrer C, et al. Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation-Lancet Commission on planetary health. *Lancet* 2015; 386: 1973–2028. ■

Chapter 1

How Australia improved health equity through action on the social determinants of health

Sharon Friel[1], Fran Baum[2], Sharon Goldfeld[3], Belinda Townsend[4], Cara Büsst[5], Lewis Keane[5]

Summary

- Do not think that the social determinants of health equity are old hat. In reality, Australia is very far away from addressing the societal level drivers of health inequity. There is little progressive policy that touches on the conditions of daily life that matter for health, and action to redress inequities in power, money and resources is almost non-existent.
- In this chapter we ask you to pause this reality and come on a fantastic journey where we envisage how COVID-19 was a great disruptor and accelerator of positive progressive action. We offer glimmers of what life could be like if there was committed and real policy action on the social determinants of health equity. It is vital that the health sector assists in convening the multisectoral stakeholders necessary to turn this fantasy into reality.

Welcome to 2030 — Australia has eliminated health inequities. Back in 2020 we were very concerned about widening health inequities. While average life expectancy had gone up steadily since the beginning of the 20th century, in 2020 men and women between the ages of 35 and 74 years living in the lowest area socio-economic quintile had mortality rates twice as high as those in the highest quintile, and these inequities widened between 2011 and 2016.[1] The data also showed that people living in outer regional, remote and very remote areas had premature death rates that were about 40% higher than in major cities, and the gap was increasing. While narrowing, the gap in life expectancy between Indigenous and non-Indigenous Australians remained very high.[2]

Then along came coronavirus disease 2019 (COVID-19). Australia was ravaged by a pandemic in 2020. The risk of death among infected people was higher among those with pre-existing health conditions,[3] the rates of which were elevated among the poor and marginalised groups.[4-6] Poor mental health got worse[7,8] — for example, in Victoria about one in five reported an increase in psychological distress. While the overall rate of high psychological distress was 16%, rates were far higher among people who were unemployed (27%), people with a disability (29%), Aboriginal and Torres Strait Islander Australians (28%), and people from bushfire-affected communities (41%).[9] Following the pandemic, rates of post-traumatic stress and anxiety stayed high for many months, swamping the mental health care system and leading to a rise in suicide.[10]

What did the patterns of inequity tell us about the causes and, importantly, the interventions? The fact that the inequities were systematic and recurring over time could not be explained by individual biology or behaviours. Are people living in poverty biologically programmed to smoke more, eat more high fat food or be more likely to contract a virus than the rich? No. Those patterns of inequity told us there was something about society that was affecting health and it was happening in an asymmetrical manner.

The social determinants of health inequities

Australia engaged in some soul searching in the wake of the pandemic and the accumulating evidence on growing inequities. In response, policy makers embraced action on the social determinants of health inequities.

The inequities in health in Australia showed that having the freedom to live a long and healthy life was not equally distributed. Pursuit of health equity recognises the need to redress the unequal distribution of these freedoms.[11] This relates to the material, psychosocial and political empowerment of individuals and communities — people need material resources for a decent life, we need to have a sense of control over our lives, and we need voice and participation in decision-making processes.[12]

These dimensions of empowerment are influenced by the way society chooses to run its affairs, which shape the conditions in which people are born, live, work, play and age. Daily living conditions affect peoples' opportunities, their chances, the ways they behave and feel, and ultimately their health.[13]

There is a wealth of evidence indicating that inequities in daily living conditions such as education, employment, lived environment and access to quality health care contribute to inequities in health outcomes. This body of work has also shown how daily living conditions are shaped by structural factors including economic globalisation, processes of urbanisation, corporate practices and products, and the sociocultural norms and values that permeate institutions and communities.[14-17]

Krieger reminded us that sometimes immediately and sometimes over longer periods of time, people embody the structural inequities and the inequities in everyday life, resulting in inequities in physical and mental health outcomes.[18] This pointed the health community towards a life course approach to our thinking and doing, which meant not only considering the roots of adult health in early life but also the inequities in social determinants across the life course.[19]

Collaboration, coalitions and solidarity

A shift in collaboration emerged from the pandemic where health actors worked strategically to form alliances and develop shared goals with communities and other stakeholders. Drawing on insights from success in multisectoral policy domains,[20-25] the health sector developed strategies to build support for a health equity movement (although it wasn't called that), and demand action from federal and state and territory governments.

The first strategy was the use of multiple frames beyond a sole health framing to build wider stakeholder support. Lessons from how Australia secured a national paid parental leave scheme[21]

[1] Australian National University, Canberra, ACT. [2] Southgate Institute for Health, Society and Equity, Flinders University, Adelaide, SA. [3] Centre for Community Child Health, Murdoch Children's Research Institute, Melbourne, VIC. [4] Menzies Centre for Health Governance, Australian National University, Canberra, ACT. [5] Victorian Health Promotion Foundation, Melbourne, VIC.
sharon.friel@anu.edu.au • doi: 10.5694/mja2.51020

pointed to the importance of drawing on several frames, such as gender equality, economics, business case and human rights, to secure support beyond the usual suspects in health promotion. Recognising the wide-ranging impacts of the pandemic and the underlying insecurities it revealed for our economy, society and environment, health actors narrated the importance of policy action for the social determinants of health equity using economic or other frames instead of an explicit health equity framing.

Second, health actors began to deepen existing networks and create entirely new networks with a broad range of actors. These included public interest government departments; non-government organisations; civil society from environment, labour, women's and welfare domains; industry (while appropriately managing any conflict of interest: Chapter 5); and experts from disciplines beyond health including the social sciences, from local community groups and from Aboriginal and Torres Strait Islander peak bodies. The use of different frames helped bridge assumptions within different disciplinary and policy domains and allowed this informal coalition to develop shared goals for policy that achieved multiple aims (eg, decent work, action on climate, health equity and supporting the economy).

As part of this coalition, researchers helped to build an evidence base of the potential impacts and benefits of policy for health, economy and other goals including human rights, climate change and gender equality. This evidence base was built in collaboration with communities, particularly those most affected by the policies.[26] Furthermore, greater democratic engagement in governance processes opened up previously closed spaces for the informal coalition to secure wider public support and political will (Chapter 7).

What did government do to address the social determinants of health inequities?

In resurrecting the Ottawa Charter for Health Promotion, the Australian health sector embraced one of its pillars — healthy public policy — as a key way of improving population health and reducing health inequities.[27]

While devastating in many ways, COVID-19 provided a policy window to intervene in the social determinants of health equity. We saw government interventions provide financial support that enabled people to have sufficient material resources and a sense of control over their lives at a time of great uncertainty.[28] Policies that were considered unthinkable before COVID-19 were introduced almost overnight as society was catapulted into new ways of being. We could discuss many issues but focus on three — income, education and housing, the fair distribution of which will advance Australia towards health equity.

Income

When COVID-19 hit, nearly 600 000 Australians lost their job in April 2020 alone[29] and many companies were at risk of going out of business. Financial stress, job insecurity and uncertainty about the future was widespread. This was on top of already high levels of poverty (14%), income inequality in Australia,[30] and a labour market with high levels of precarious employment[31] that had adversely affected Australians' income, job security and access to paid sick leave.[32-35]

Following the height of the pandemic and the now broader appreciation of the link between meaningful employment and health, the federal government introduced the Fair and Equitable JobKeeper wage subsidy, which increased cash flow for businesses affected by COVID-19. This was an excellent intervention, providing immediate employment and financial security to more than 3 million people, many of whom were low paid workers.

More important for long term health equity was the requirement that for companies to receive the Fair and Equitable JobKeeper subsidy they needed to ensure that all casual workers were eligible, regardless of citizenship and length of time with their employer; there were no stand down or enabling directions; and all companies provided good quality jobs and decent working conditions, including paid sick and isolation leave. This was accompanied by the launch of a national employment strategy called Decent Work for All, supported by a Just Transitions framework providing re-training, recruitment and income support, which transitioned workers away from fossil fuel and other health harmful commodity industries.[28,36]

At the same time, a fundamental change occurred — the federal government reformed social policy based on principles of social justice and dignity. All income support schemes — now located within a policy called Supporting Australians in Need — were recalculated to ensure that they provided a living income well above the poverty line, and these reforms were not just for the COVID-19 time period. An analysis by the Australia Institute suggested that if they had not done so, 370 000 Australians, including 80 000 children, would have been pushed into poverty.[37] That would most certainly have widened health inequities.

Education

There was real concern across Australia about the impact of COVID-19 on children and young adults. Child development occurs within a complex system where biology interacts with the environment in which children live, learn and grow. Inequities in childhood track into adulthood, where they carry high costs for individuals and society, including poor health, lower educational attainment, increased crime and lost human productivity.[38] Delivered with sufficient quality and dose, early childhood education and care (ECEC) is an extremely important setting for equitable child health and development outcomes.

In 2020, a federal free childcare policy was introduced as a temporary measure to ensure that childcare centres survived the COVID-19 lockdown. The government paid childcare services a weekly subsidy to continue to deliver ECEC. Early evidence suggested that socially disadvantaged families were accessing ECEC in higher numbers and for longer hours, coming closer to the 15 hours per week for 3- and 4-year-olds for which the evidence is strongest.[39,40] In late 2020, the government extended free ECEC indefinitely for all 3- and 4-year-old children, with some high income tests on eligibility for younger children. The benefits of retaining free childcare included short term stimulus to the economy and longer term benefits for health, equity and the economy.[41] As women's attachment to the workforce was strengthened following COVID-19, the economy grew by more than 3% gross domestic product as predicted,[42] and all children benefited from cognitive, social and behavioural development and school readiness through high quality universal early childhood development and care programs.[43]

In primary and secondary education, COVID-19 placed further pressure on schooling as several states and territories experienced periods of school closures and remote learning from home. According to a Grattan Institute report in 2020, most students did not learn as much while at home as they would have in their classroom — and disadvantaged students were hardest hit.[44] As education remains the most powerful social determinant to address

intergenerational disadvantage and build the human capacity to attain a healthy, sustainable and prosperous society, there was a national commitment to addressing educational inequity.

Following the COVID-19 pandemic, schools adopted multidisciplinary (health and education) platforms to deliver a holistic and equitable approach to education, child development and wellbeing.[45] Federal and state and territory governments worked together to develop the Education for All policy, building on a needs-based funding approach, informed by past analysis by Gonski and colleagues.[46] The funding model specified increased per-student funding for younger students to ensure an early advantage, equity-based funding for socially disadvantaged areas contingent on evidence-based strategies, and accountability metrics that were linked to high quality, measurable education provision. Within 10 years, the National Assessment of Academia, Health and Wellbeing (previously called NAPLAN) showed no population differences across social groups.

Housing

Having a safe, stable and secure home is essential for long term health and wellbeing, and every Australian has the right to adequate housing.[47] In spite of this, before the COVID-19 pandemic, over 116 000 Australians were classified as being homeless and about 8000 were sleeping on the streets on any given night,[48] more than a million people were in rental stress,[49] and waiting lists for social housing were into the hundreds of thousands.[50] COVID-19 stay-at-home restrictions brought a new level of visibility to these issues among the community, and community mobilisation forced governments to act both in the short and long term.

In March 2020, state governments immediately found funding for temporary accommodation to keep homeless people safe,[51] and the federal government announced a short term moratorium on evictions for tenants who were unable to pay the rent.[52] In 2021, state and territory governments worked with the Australian Council of Social Service to develop nationally consistent protection for renters through legislative changes, getting rid of no grounds evictions, limiting rent increases, tightening application processes to stop discrimination, and detailing minimum property standards to ensure all rental properties were liveable.

During the second wave of infections in 2020, residents of nine social housing towers in inner Melbourne were placed into a hard lockdown without warning.[53] Never had the broader community had a clearer insight into the systemic inequities experienced by those living in social housing (eg, low incomes, high unemployment, limited access to education), and the inadequacy of the accommodation itself (overcrowding, lack of operable windows and ventilation, poorly maintained/non-functioning elevators).[53] As a result of public outcry and overwhelming community support to create more social housing,[54] the federal government initiated the Green Social Housing Economic Stimulus Package. The package built 30 000 environmentally sustainable social housing units between 2021 and 2025, supported about 18 000 construction jobs per year, and increased gross domestic product by roughly $6 billion.[55] More importantly, all social housing built or renovated since 2021 was required to adequately address accessibility, cultural adequacy, availability of services, materials, facilities and infrastructure, and environmental sustainability.

What else happened?

The period between 2020 and 2030 was a time of great upheaval. As Australia recovered from the pandemic, we prioritised health equity at the centre of policy, governance and regulation across a whole-of-government approach. The new policies were supported by health systems that shifted focus to comprehensive primary health care, prevention and promotion. There was a national health equity strategy guiding the actions of all government departments. While there was an initial focus on income, employment, education and housing innovations, the success of these strategies in improving health across the population led to a new interest in addressing the structural drivers of health inequities. This included the inequities in power, money and resources that had widened before the pandemic. A tax transparency review by the Australian Tax Office instigated a progressive taxation policy following the COVID-19 outbreak.[56] Tax policy was amended to reflect progressive and fair taxation, including taxation in Australia for multinational companies. Climate change and green technologies, and labour conditions especially in the care economy became key tenets of trade and investment policy, as did attention to the health consequences of trade agreements.[57] The processes of policy making changed, with greater deliberative experiments and democratic renewal at the local, state/territory and federal level. A treaty was signed with Australia's Aboriginal and Torres Strait Islander population, which gave First Nations people a central voice in all policy processes at every level.

Conclusion

The fantastic journey laid out in this chapter offers glimmers of hope for what the future could bring if there was committed social and policy action on the social determinants of health equity. Sadly, the reality is that social and health inequities and environmental degradation are getting worse, shining a light on the continuing fundamental ruptures in today's society. However, a systems perspective reminds us that nothing is static, and that the shifting political and economic sands due to COVID-19 provide an important window of opportunity to collectively change the system such that communities are able to live with good health, dignity and in an environmentally sustainable way.

Each of us concerned about human health, environmental sustainability and social justice mobilise and work in different ways and in different venues towards a vision of fair and just systems. Many people concerned with these issues work within government. They work with regulatory powers and make fundamental incremental change to systems that are each essential for health, equity and sustainability. Others are part of non-government organisations and coalitions working to support communities and demand action from government. Researchers provide important evidence, which may be ignored or buried by some but is not ignored all the time. There are many partners to help create systems of hope. Now is the time for the Australian health community to advocate for multisectoral coalitions to disrupt the status quo and turn the fantasy we have described into reality.

Acknowledgements: This chapter is part of a supplement funded by the Victorian Health Promotion Foundation (VicHealth). VicHealth is a pioneer in health promotion. It was established by the Victorian Parliament as part of the *Tobacco Act 1987* and has a primary focus on promoting good health for all and preventing chronic disease.

Competing interests: No relevant disclosures.

Provenance: Commissioned; externally peer reviewed. ■

How to cite this chapter: Friel S, Baum F, Goldfield S, et al. How Australia improved health equity through action on the social determinants of health. *Med J Aust* 2021; 214 (8 Suppl): S7–S11.

1 Adair T, Lopez AD. Widening inequalities in premature mortality in Australia, 2006–16. *Aust Pop Stud* 2020; 4: 37–56.

2 Australian Institute of Health and Welfare. Deaths in Australia [web report]. Last updated: 7 Aug 2020. https://www.aihw.gov.au/reports/life-expectancy-death/deaths-in-australia/contents/summary (viewed Feb 2021).

3 Australian Department of Department of Health. Coronavirus (COVID-19) advice for people with chronic health conditions. https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19/coronavirus-covid-19-advice-for-people-with-chronic-health-conditions (viewed June 2020).

4 Bambra C, Riordan R, Ford J, et al. The COVID-19 pandemic and health inequalities. *J Epidemiol Community Health* 2020; 74: 964–968.

5 Chen JT, Krieger N. Revealing the unequal burden of COVID-19 by income, race/ethnicity, and household crowding: US county vs ZIP code analyses (HCPDS Working Paper Vol. 19, No. 1). Cambridge, MA: Harvard Center for Population and Development Studies, 2020. https://www.hsph.harvard.edu/social-and-behavioral-sciences/2020/04/24/covid-19-and-health-inequities-study-by-jarvis-t-chen-and-nancy-krieger/ (viewed Feb 2021).

6 Australian Institute of Health and Welfare. Australia's health 2020: in brief. Release date: 23 July 2020. https://www.aihw.gov.au/reports/australias-health/australias-health-2020-in-brief/contents/summary (viewed Feb 2021).

7 Hashmi R, Alam K, Gow J. Socioeconomic inequalities in mental health in Australia: explaining life shock exposure. *Health Policy* 2020; 124: 97–105.

8 Stanton R, To QG, Khalesi S, et al. Depression, anxiety and stress during COVID-19: associations with changes in physical activity, sleep, tobacco and alcohol use in Australian adults. *Int J Environ Res Public Health* 2020; 17: 4065.

9 Victorian Health Promotion Foundation. VicHealth coronavirus wellbeing impact study: follow-up survey. Melbourne: VHPF, 2020. https://www.vichealth.vic.gov.au/media-and-resources/publications/vichealth-coronavirus-victorian-wellbeing-impact-study-follow-up-survey# (viewed Feb 2021).

10 Atkinson J-A, Skinner A, Lawson K, et al. Road to recovery: restoring Australia's mental wealth. Uncovering the road to recovery of our mental health and wellbeing using systems modelling and simulation. Sydney: Brain and Mind Centre, University of Sydney, 2020. https://www.sydney.edu.au/content/dam/corporate/documents/brain-and-mind-centre/road-to-recovery_brain-and-mind-centre.pdf (viewed Feb 2021).

11 Abel T. Cultural capital and social inequality in health. *J Epidemiol Community Health* 2008; 62: e13.

12 Abel T, Frohlich KL. Capitals and capabilities: Linking structure and agency to reduce health inequalities. *Soc Sci Med* 2012; 74: 236–244.

13 Commission on the Social Determinants of Health. Closing the gap in a generation: health equity through action on the social determinants of health. Final report of the Commission on the Social Determinants of Health. Geneva: WHO. 2008. https://www.who.int/publications/i/item/WHO-IER-CSDH-08.1 (viewed Feb 2021).

14 Coburn D. Beyond the income inequality hypothesis: class, neo-liberalism, and health inequalities. *Soc Sci Med* 2004; 58: 41–56.

15 Thisted RA. Are there social determinants of health and disease? *Perspect Biol Med* 2003; 46: 65–73.

16 Marmot M, Wilkinson R. Social determinants of health. 2nd ed. Oxford: Oxford University Press, 2005.

17 Daniels N, Kennedy BP, Kawachi I. Why justice is good for our health: the social determinants of health inequalities. *Daedalus* 1999; 128: 215–251.

18 Krieger N. Embodying inequality: a review of concepts, measures, and methods for studying health consequences of discrimination. *Int J Health Serv* 1999; 29: 295–352.

19 Braveman P. What is health equity: and how does a life-course approach take us further toward it? *Matern Child Health J* 2014; 18: 366–372.

20 Townsend B, Friel S, Schram A, et al. What generates attention to health in trade policymaking? Lessons from success in tobacco control and access to medicines: a qualitative study of Australia and the (Comprehensive and Progressive) Trans-Pacific Partnership. *Int J Health Policy Manag* 2020; https://doi.org/10.34172/ijhpm.2020.80 [online ahead of print].

21 Townsend B, Friel S, Baker P, et al. How can multiple frames enable action on social determinants? Lessons from Australia's paid parental leave. *Health Promot Int* 2019; 35: 973–983.

22 Mackean T, Fisher M, Friel S, et al. A framework to assess cultural safety in Australian public policy. *Health Promot Int* 2020; 35: 340–351.

23 Freeman T, Fisher M, Baum F, et al. Healthy infrastructure: Australian National Broadband Network policy implementation and its importance to health equity. *Inf Commun Soc* 2019; 22: 1414–1431.

24 Mackean T, Fisher M, George E, et al. Improving 'Closing the Gap' policy to support Aboriginal and Torres Strait Islander sovereignty and wellbeing. Proceedings of the Lowitja Institute International Indigenous Health and Wellbeing Conference 2019; 18-20 June, Darwin, Australia.

25 Fisher M, Baum F, Kay A, et al. Are changes in Australian national primary healthcare policy likely to promote or impede equity of access? A narrative review. *Aust J Prim Health* 2017; 23: 209–215.

26 Browne-Yung K, Ziersch A, Baum F, et al. General Motor Holden's closure in Playford, South Australia: analysis of the policy response and its implications for health. *Aust J Pub Admin* 2019; 79: 76–92.

27 World Health Organization, Health and Welfare Canada, Canadian Public Health Association. Ottawa charter for health promotion. Ottawa, 1986. https://www.who.int/teams/health-promotion/enhanced-wellbeing/first-global-conference (viewed Feb 2021).

28 Friel S, Goldman S, Townsend B, et al. Australian COVID-19 policy responses: good for health equity or a missed opportunity? Canberra: Australian National University, 2020. http://regnet.anu.edu.au/research/publications/8023/australian-covid-19-policy-responses-good-health-equity-or-missed (viewed Feb 2021).

29 Australian Bureau of Statistics. Labour Force, Australia. April 2020. https://www.abs.gov.au/ausstats/abs@.nsf/Previousproducts/6202.0Media%20Release1Apr%202020?opendocument&tabname=Summary&prodno=6202.0&issue=Apr%202020&num=&view (viewed July 2020).

30 Australian Council of Social Service and University of New South Wales. Inequality in Australia 2018. Sydney: ACOSS and UNSW. 2018. https://www.acoss.org.au/wp-content/uploads/2018/07/Inequality-in-Australia-2018.pdf (viewed Feb 2021).

31 Independent Inquiry into Insecure Work in Australia and Australian Council of Trade Unions. Lives on hold: unlocking the potential of Australia's workforce. Melbourne: ACTU, 2012. https://www.actu.org.au/media/349417/lives_on_hold.pdf (viewed Feb 2021).

32 Beer A. The closure of the Australian car manufacturing industry: redundancy, policy and community impacts. *Aust Geogr* 2018; 49: 419–438.

33 Denniss R, Baker D. Are unemployment benefits adequate in Australia? (Policy Brief No. 39). Canberra: Australia Institute, 2012. https://australiainstitute.org.au/wp-content/uploads/2020/12/PB-39-Are-unemployment-benefits-adequate-in-Australia_4.pdf (viewed Feb 2021).

34 Broom D, D'Souza RM, Strazdins L, et al. The lesser evil: bad jobs or unemployment? A survey of mid-aged Australians. *Soc Sci Med* 2006; 63: 575–586.

35 Leigh A. Battlers & billionaires: the story of inequality in Australia. Melbourne: Black Inc., 2013.

36 Townsend B. Next steps for elevating health on trade and investment policy agendas. *Int J Health Policy Manag* 2020; 9: 312–314.

37 Australia Institute. JobSeeker supplement cut: 22,000 South Australians put into poverty, including 3,000 children. 31 July 2020. https://australiainstitute.org.au/post/jobseeker-supplement-cut-22000-south-australians-put-into-poverty-including-3000-children/ (viewed Feb 2021).

38 Hertzman C, Boyce T. How experience gets under the skin to create gradients in developmental health. *Annu Rev Public Health* 2010; 31: 329–347.

39 Hall J, Sylva K, Sammons P, et al. Can preschool protect young children's cognitive and social development? Variation by center quality and duration of attendance. *Sch Eff Sch Improv* 2013; 24: 155–176.

40 Press F, Harrison L, Ungerer J, et al. Child care and early education in Australia: the longitudinal study of Australian children (Social Policy Research Paper. No. 40). Canberra: Australian Government Department of Families, Housing, Community Services and Indigenous Affairs, 2009.

41 Grudnoff M, Denniss R. Participating in growth: free childcare and increased participation. Canberra: Australia Institute, 2020. https://australiainstitute.org.au/report/participating-in-growth-free-childcare-and-increased-participation/ (viewed Feb 2021).

42 De Henau J, Himmelweit S, Łapniewska Z, et al. Investing in the care economy: a gender analysis of employment stimulus in seven OECD countries. Brussels: International Trade Union Federation, 2016. https://www.ituc-csi.org/IMG/pdf/care_economy_en.pdf (accessed 5/2/2021).

43 Victorian Health Promotion Foundation. Promoting equity in early childhood development for health equity through the life course: and evidence summary. Melbourne: VicHealth, 2015. https://www.vichealth.vic.gov.au/-/media/ResourceCentre/PublicationsandResources/Health-Inequalities/Fair-Foundations/Summary/Healt

h-Equity_Summary-Report_EarlyChildhoodDev.pdf?la=en&hash=748376B8804BAA857C55716CE097958023693D22 (viewed Feb 2021).

44 Sonnemann J, Goss P. COVID catch-up: helping disadvantaged students close the equity gap. Melbourne: Grattan Insitute, 2020. https://apo.org.au/sites/default/files/resource-files/2020-06/apo-nid306245.pdf (viewed Feb 2021).

45 Cloney D, Cleveland G, Hattie J, et al. Variations in the availability and quality of early childhood education and care by socioeconomic status of neighborhoods. *Early Educ Dev* 2016; 27: 384–401.

46 Gonski D, Boston K, Greiner K, et al. Review of funding for schooling — final report. Canberra: Australian Government, 2011. https://www.dese.gov.au/school-funding/resources/review-funding-schooling-final-report-december-2011 (viewed Feb 2021).

47 United Nations. International Covenant on Economic, Social and Cultural Rights, 1966. https://www.ohchr.org/en/professionalinterest/pages/cescr.aspx (viewed Feb 2021).

48 Australian Bureau of Statistics. Census of Population and Housing: estimating homelessness. 2016. https://www.abs.gov.au/statistics/people/housing/census-population-and-housing-estimating-homelessness/latest-release (viewed Feb 2021).

49 Pawson H, Milligan V, Yates J. Housing policy in Australia: a case for system reform. Singapore: Palgrave Macmillan, 2020.

50 Australian Institute for Health and Welfare. Housing assistance in Australia 2019 [web report]. https://www.aihw.gov.au/reports/housing-assistance/housing-assistance-in-australia-2019/contents/summary (viewed Feb 2021).

51 Stayner T. Homeless get access to Victorian aged-care facilities to recover from coronavirus. *SBS News* 2020; 10 Apr. https://www.sbs.com.au/news/homeless-get-access-to-victorian-aged-care-facilities-to-recover-from-coronavirus (viewed Feb 2021).

52 Prime Minister of Australia. National Cabinet statement. 29 Mar 2020. https://www.pm.gov.au/media/national-cabinet-statement (viewed Feb 2021).

53 Carrasco S, Faleh M, Dangol N. Our lives matter – Melbourne public housing residents talk about why COVID-19 hits them hard. *The Conversation* 2020; 24 July. https://theconversation.com/our-lives-matter-melbourne-public-housing-residents-talk-about-why-covid-19-hits-them-hard-142901 (viewed Feb 2021).

54 Victorian Council of Social Service. Victorians back significant social housing push [media release]. 5 Aug 2020. https://vcoss.org.au/news/2020/08/victorians-back-social-housing/ (viewed Feb 2021).

55 SGS Economics and Planning. Economic impacts of social housing investment. Final report, June 2020. https://www.sgsep.com.au/assets/main/SGS-Economics-and-Planning-SHARP-Final-ReportSGS.pdf (viewed Feb 2021).

56 Khadem N. ATO data reveals one third of large companies pay no tax. *ABC News* 2020; 2 Jan. https://www.abc.net.au/news/2019-12-12/ato-corporate-tax-transparency-data-companies-no-tax-paid/11789048?nw=0 (viewed Aug 2020).

57 Friel S, Schram A, Townsend B. The nexus between international trade, food systems, malnutrition and climate change. *Nat Food* 2020; 1: 51–58. ■

Chapter 2
Aboriginal and Torres Strait Islander connection to culture: building stronger individual and collective wellbeing

Summer M Finlay[1,2], Karla Canuto[3,4], Kootsy Canuto[3,4], Nadia Neal[1], Raymond W Lovett[5]

Summary

- Aboriginal and Torres Strait Islander peoples have long maintained that culture (ie, practising, maintaining and reclaiming it) is vital to good health and wellbeing. However, this knowledge and understanding has been dismissed or described as anecdotal or intangible by Western research methods and science. As a result, Aboriginal and Torres Strait Islander culture is a poorly acknowledged determinant of health and wellbeing, despite its significant role in shaping individuals, communities and societies.
- By extension, the cultural determinants of health have been poorly defined until recently. However, an increasing amount of scientific evidence supports what Aboriginal and Torres Strait Islander people have always said — that strong culture plays a significant and positive role in improved health and wellbeing.
- Owing to known gaps in knowledge, we aim to define the cultural determinants of health and describe their relationship with the social determinants of health, to provide a full understanding of Aboriginal and Torres Strait Islander wellbeing. We provide examples of evidence on cultural determinants of health and links to improved Aboriginal and Torres Strait Islander health and wellbeing.
- We also discuss future research directions that will enable a deeper understanding of the cultural determinants of health for Aboriginal and Torres Strait Islander people.

The focus on how to improve the health and wellbeing of Aboriginal and Torres Strait Islander peoples and nations has largely centred on the social determinants of health,[1] which have been defined as:

> the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life. These forces and systems include economic policies and systems, development agendas, social norms, social policies and political systems.[2]

However, limited analysis from Australia shows that between half and two-thirds of the current inequity is unexplained when Aboriginal and Torres Strait Islander and non-Indigenous populations are compared.[3-5] What this means is that where an Aboriginal or Torres Strait Islander person has the same education, socio-economic position and level of health behaviour, disparity of health outcomes decreases by about a third. Still, the disparity is not eliminated.[6] To reach equal life chances (as per the stated national policy goal of Closing the Gap), we need to understand the currently unexplained 47% of the contribution to the gap.

Culture plays a significant role in the way people engage with the world.[7-10] While it is difficult to define, culture is commonly described as the ever-evolving "practices, representations, languages and customs of any specific society".[11] Culture significantly shapes our ontology, epistemology and axiology — that is how we view the world, how we believe knowledge is generated and our values.[8,10] Culture also shapes the way we see health and wellbeing, which is something that Aboriginal and Torres Strait Islander peoples have long recognised.[10-12] This is demonstrated in the Aboriginal community controlled health sector, which improves the health and wellbeing of Aboriginal and Torres Strait Islander people[13,14] by using a model of care that is centred on culture.[14-16]

Culture has featured prominently, even if not labelled as such, in Aboriginal and Torres Strait Islander health and wellbeing policies and programs. In 1989, a National Aboriginal Health Strategy (NAHS) was published, and it defined health as a "whole of life view incorporating the cyclical concept of life–death–life and the relationship to the land".[17] The National Aboriginal Community Controlled Health Organisation expanded on the NAHS definition and defined health in their constitution as:

> not just the physical well-being of an individual but … the social, emotional and cultural well-being of the whole Community in which each individual is able to achieve their full potential as a human being thereby bringing about the total well-being of their Community. It is a whole of life view and includes the cyclical concept of life–death–life.[18]

Despite culture being foundational to all approaches to Aboriginal and Torres Strait Islander health and wellbeing, cultural determinants of health beyond the health initiatives and approaches led by Aboriginal and Torres Strait Islander groups have not been acknowledged as underpinning determinants of health and wellbeing.[19] For example, biomedicine is the most prevalent form of health therapy today and is based on beliefs, practices and behaviours that have evolved over time.[20] Culture's importance as a determinant of health and wellbeing reflects the multifaceted way we need to view health, not merely part of the current proximal–distal orthodoxy pervading public health.[21] Incorporating fundamental beliefs, systems and histories of populations with economic, political and social ecosystems allows us to view and analyse the multilayered, multifaceted interactions that produce health and wellbeing across levels, pathways and powers that produce inequity.[21]

The current social determinants of health and biomedical approach are insufficient to understand contributions to our health and wellbeing — they both utilise the proximal–distal conceptual approach that limits our understanding, and in some cases obscure the true nature of what contributes to inequity.[21] So our understanding of Aboriginal and Torres Strait Islander health and wellbeing needs to evolve and incorporate the cultural determinants of health as another layer in this complex web.

[1] University of Wollongong, Wollongong, NSW. [2] University of Canberra, Canberra, ACT. [3] Wardliparingga Aboriginal Research Unit, South Australian Health and Medical Research Institute, Adelaide, SA. [4] University of Adelaide, Adelaide, SA. [5] National Centre for Epidemiology and Population Health, Australian National University, Canberra, ACT. ✉ sfinlay@uow.edu.au
• doi: 10.5694/mja2.51020

Aboriginal and Torres Strait Islander cultural determinants of health

The cultural determinants of health require taking "a strength based perspective, acknowledging that stronger connections to culture and Country build stronger individual and collective identities, a sense of self-esteem, resilience, and improved outcomes".[22] From an Aboriginal and Torres Strait Islander standpoint, the cultural determinants of health "are enabled, supported and protected through traditional cultural practice, kinship, connection to land and Country, art, song and ceremony, dance, healing, spirituality, empowerment, ancestry, belonging and self-determination".[23]

Recent publications describe Aboriginal and Torres Strait Islander cultural determinants of health across a similar range of domains.[23-27] Aboriginal and Torres Strait Islander cultural domains are described in Box 1, which includes explanations of how these domains are conceptualised.

Understanding the cultural determinants of health and their contribution to improved health and wellbeing has led to two recent studies — a local study and a national study.[26,27] The studies aim to develop measures of culture, identity and life from the perspective of Aboriginal and Torres Strait Islander people alongside other measures of life circumstances such as employment, health and education. Similarly, both studies seek to establish a baseline set of wellbeing data to make informed decisions on designing programs which will strengthen cultures and wellbeing. Finally, each study aims to assist policy makers to better understand wellbeing from Aboriginal and Torres Strait Islander perspectives, and ensure that policies and programs can reflect this.[26,27] These studies are the culmination of literature and dialogue relating to Aboriginal and Torres Strait Islander cultural determinants of health that have been maturing since 2004.[28]

The current state of evidence on the cultural determinants of health

The evidence base on the cultural determinants of health for Indigenous people globally has grown over the past 20 years.[22] Much of this work followed from seminal work where First Nations cultural continuity was identified as a factor in substantially reducing the risk of youth suicide in First Nations communities in British Columbia.[29] While Aboriginal and Torres Strait Islander people have been applying cultural determinants of health in practice for millennia, the conceptual development of Aboriginal and Torres Strait Islander cultural determinants of health has been limited in academia and in policy.

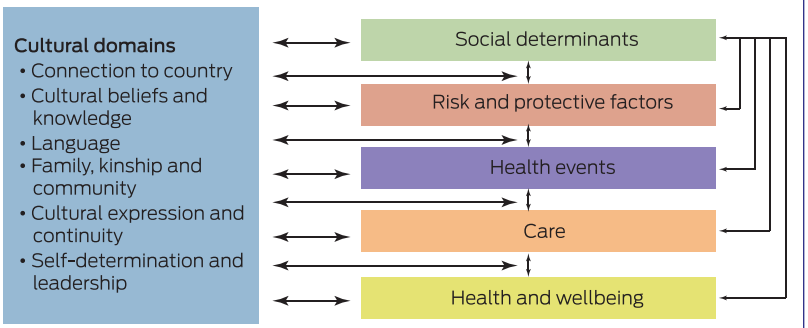
In 2018, a review of publications relating to cultural determinants of health was undertaken.[24] It included 72 research articles which revealed that, despite conceptual variations in defining and measuring culture, the literature largely confirmed that culture is significantly and positively associated with physical health, social and emotional wellbeing, and reductions in behaviour that is detrimental to health and wellbeing.[24] The review also found that some cultural domains — including language, cultural expression and connection to country — were more likely to be reported in quantitative studies. In contrast, the cultural domains of knowledge, beliefs, kinship and family were more likely to be reported in studies that used qualitative methods, and were informing further research, concept discussions and the construction of conceptual frameworks.

A recently conducted scoping review of Aboriginal and Torres Strait Islander health promotion programs focused on modifying chronic disease risk factors. It concluded that "any future health promotion programs should also prioritise integration of culture, social and emotional wellbeing and specific strategies developed by or with Aboriginal and Torres Strait Islander people".[30] Health promotion designed by Aboriginal and Torres

1 Aboriginal and Torres Strait Islander cultural domains and their conceptual meanings[24,25]

Cultural domain	Conceptual meaning
Connection to country	Country and connection to country are closely related to identity, attachment with the physical environment, and a sense of belonging. In Indigenous cultures, people have both physical and spiritual relationships and responsibilities to look after and maintain country. This, in turn, is thought to provide nurturing and empowerment to individuals, their families and their communities.
Indigenous beliefs and knowledge	Knowledge and belief systems include concepts of relational identity, spirituality and within-group variation on cultural traditions. Concepts and experiences of spirituality stem from the Dreaming (creation) and include how these are passed on through various mediums (art, songs, and ceremony or corroboree). This domain also incorporates elements of healing, traditional medicines and gendered knowledge systems and practices.
Indigenous language	Indigenous verbal, written and body language is conceptualised as a vehicle for expressing culture, communicating it to others, and transmitting cultural knowledge to the next generation. Language reclamation has also been linked with enhancing other cultural determinants, and therefore health and wellbeing.[27]
Family, kinship and community	Identity is not only connected to genetics but predicated on descent and social relationships. Kinship includes knowing and being part of the community, and the perception of oneself. Indigenous society is constructed around community and within strong kinship and family ties. Being a part of the community may entail various responsibilities and obligations that confirm and reinforce membership and belonging. This may include obligations to extended family, responsibilities to be involved in various community functions and initiatives, and responsibilities to be active in political issues.
Cultural expression and continuity	Cultural expression and continuity are conceptualised as actions taken to express attitudes, beliefs, customs and norms, including how these are maintained over time. The expression can often take the form of artefacts, symbols, dances, songs, gender and age roles, art and ceremony, storytelling, use of language, family relations, sharing of food and celebrations, and representation of values.
Self-determination and leadership	Self-determination is contextualised as leading, or at a minimum being involved in, decision making at the individual, family, community, organisational and political levels. It is also contextualised as how Indigenous peoples do business, and involves power and influence. It is generally considered as a collective form of decision making.

2 Mayi Kuwayu Study conceptual model of Aboriginal and Torres Strait Islander cultural determinants of health[27]



Strait Islander people is often designed using a cultural framework. Adapting programs designed for and by other populations is insufficient. Superficial changes to programs, such as the use of local language and "Indigenous" graphics, fail to acknowledge Aboriginal and Torres Strait Islander people's world views and cultural determinants of health.

A recent example of the conceptual development of Aboriginal and Torres Strait Islander cultural determinants of health is from the Mayi Kuwayu Study.[27] This conceptual model incorporates the social determinants of health and also enquires as to how Aboriginal and Torres Strait Islander cultural determinants of health interact directly and indirectly across health and wellbeing (Box 2).

The interconnectedness of cultural determinants of health has also been identified.[10,22,25,29,31,32] For example, the Barngarla Language and Wellbeing Study in South Australia showed that reclamation and use of Barngarla language led to improved Aboriginal wellbeing. The study highlighted that language reclamation improved connection to country, culture, spirituality, ancestors, family and kinship, and had a positive impact on social and emotional wellbeing.[33] Language reclamation was seen as a way of healing from colonial disruptions to cultural identity, and facilitating the ongoing transfer of cultural knowledge and heritage. The interconnectedness of country, language and culture is closely tied to identity and wellness, as exemplified by the following comment from one of the study's participants:

> I think it's very important that we … get to learn what's us, what makes us, us. And that's our language and that's our culture and that's our Dreaming. Those three there are interconnected with who we are as Aboriginal people.[22]

Future research directions

The policy landscape in Australia is heavily geared towards the social determinants of health.[1,28] Implementation of this type of approach is often devoid of a cultural lens or understanding, and assumes a mono-sociocultural standpoint.[34] Since the early criticisms of the social determinants of health approach (for omitting cultural determinants of health) an evidence base has developed.[28] This has led to the cultural determinants of health becoming central features in contemporary national Aboriginal and Torres Strait Islander health policy.[10,22,35,36] A participant at a recent national policy consultation stated:[3]

> Culture is central to Aboriginal and Torres Strait Islander wellbeing and needs to be embraced and embedded across a range of Aboriginal and Torres Strait Islander and mainstream services — both as a protector and enabler of health and wellbeing.[22]

The opposite side of the cultural determinants of health coin is racism, including overt, institutional and systemic racism. While cultural and social determinants of health are critical to policy and programs, the trauma of dispossession, paternalism and racism (including transgenerational trauma) that has been inflicted on Aboriginal and Torres Strait Islander peoples requires investigation for impacts on health and wellbeing outcomes in addition to a policy and program response.[10,37] Unsurprisingly, a sole focus on the social determinants of health has not resulted in significant health, social and emotional wellbeing outcomes for Aboriginal and Torres Strait Islander people. While there needs to be a focus on salutogenic cultural attributes, we also need to interrogate how settler–colonial culture has had, and continues to have, negative effects on Aboriginal and Torres Strait Islander wellbeing.[10,37]

Understanding how to embed a cultural determinants of health approach into policy requires systemic changes in terms of how programs are designed, who designs them, and how they are monitored and evaluated. Key to such change is Aboriginal and Torres Strait Islander leadership, as this will ensure that cultural protocols are part of the process. Ensuring cultural diversity in implementation requires national and/or state-based policy and program development, and will depend on flexible implementation that enables individual communities to tailor approaches as needed — something that has long been called for. With the move towards ensuring that cultural determinants of health are central in health and wellbeing policy and programs, we need to consider how we monitor and evaluate their implementation and impacts on health and wellbeing. Such monitoring and evaluation should be guided by recent developments in the Indigenous data sovereignty policy, program monitoring and evaluation space.[38]

Further areas of research that need to be led by Aboriginal and Torres Strait Islander peoples include item and instrument development, appropriate data collection, and implementation of Indigenous data sovereignty to protect cultural information. In addition, adequate funding is needed for research into how the cultural determinants of health can inform policy, programs and services beyond the health sphere, including implementation and knowledge transfer. The new generation of evidence resulting from such research will lead to the further development and refinement of theory and research. This will enable a deeper understanding of the cultural determinants of health for Aboriginal and Torres Strait Islander peoples.

Conclusion

While Aboriginal and Torres Strait Islander people have long understood the role that culture plays in health and wellbeing, the elucidation of the cultural determinants of health is much more recent. The state of scientific evidence, although emergent, shows links between culture and health and wellbeing outcomes, something long understood by Aboriginal and Torres Strait Islander peoples.

Policy is shifting but, for the cultural determinants of health to be implemented, a seismic shift in the current paradigm of government-led policy making is required. This means ceding power to Aboriginal and Torres Strait Islander peoples. While there have been shifts in policy mechanisms, which ensure Aboriginal and Torres Strait Islander leadership across all policies that affect Aboriginal and Torres Strait Islander people, these are yet to be comprehensively introduced. Furthermore, governments need to ensure that Aboriginal and Torres Strait Islander people and organisations are resourced to effectively develop and implement cultural determinants of health programs that meet the needs of their communities.

When the cultural determinants of health become core to policy and programs, it is likely that trauma and racism will decline, and that we will see a significant shift in the health and wellbeing of Aboriginal and Torres Strait Islander people. Without acknowledgement of the cultural determinants of health, we will probably never see justice or "close the gap".

Acknowledgements: This chapter is part of a supplement funded by the Victorian Health Promotion Foundation (VicHealth). VicHealth is a pioneer in health promotion. It was established by the Victorian Parliament as part of the *Tobacco Act 1987* and has a primary focus on promoting good health for all and preventing chronic disease.

Competing interests: No relevant disclosures.

Provenance: Commissioned; externally peer reviewed. ■

How to cite this chapter: Finlay SM, Canuto K, Canuto K, et al. Aboriginal and Torres Strait Islander connection to culture: building stronger individual and collective wellbeing. *Med J Aust* 2020; 214 (8 Suppl): S12–S16.

1 Commission on Social Determinants of Health. Closing the gap in a generation: health equity through action on the social determinants of health — final report of the commission on social determinants of health. Geneva: World Health Organization, 2008. https://www.who.int/publications/i/item/WHO-IER-CSDH-08.1 (viewed Mar 2021).

2 World Health Organization. Social determinants of health. Geneva: WHO, 2021. https://www.who.int/health-topics/social-determinants-of-health#tab=tab_1 (viewed Mar 2021).

3 Booth AL, Carroll N. The health status of Indigenous and non-Indigenous Australians (IZA Discussion Paper No. 1534). Bonn: Institute for the Study of Labor, 2005. https://www.iza.org/publications/dp/1534/the-health-status-of-indigenous-and-non-indigenous-australians (viewed Mar 2021).

4 Australian Institute of Health and Welfare. Australia's health 2014 (AIHW Cat. No. AUS 178; Australia's Health Series No. 14). Canberra: AIHW, 2014. https://www.aihw.gov.au/reports/australias-health/australias-health-2014/contents/table-of-contents (viewed Mar 2021).

5 Zhao Y, Wright J, Begg S, Guthridge S. Decomposing Indigenous life expectancy gap by risk factors: a life table analysis. *Popul Health Metrics* [internet] 2013; 11: 1.

6 Australian Institute of Health and Welfare. Australia's health 2018: in brief (AIHW Cat. No. AUS 222). Canberra: AIHW. 2018. https://www.aihw.gov.au/reports/australias-health/australias-health-2018-in-brief/contents/about (viewed Mar 2021).

7 Keane M. Science education and worldview. *Cult Stud Sci Educ* 2008; 3: 587–621.

8 Utsey SO, Fischer NL, Belvet B. Culture and worldview in counseling and psychotherapy: recommended approaches for working with persons from diverse sociocultural backgrounds. In: Leach MM, Aten JD eds. Counseling and psychotherapy. Culture and the therapeutic process: a guide for mental health professionals. New York: Routledge/Taylor and Francis Group, 2010: 181–199.

9 Kawagley AO, Norris-Tull D, Norris-Tull RA. The indigenous worldview of Yupiaq culture: its scientific nature and relevance to the practice and teaching of science. *J Res Sci Teach* 1998; 35: 133–144.

10 Arabena K. 'Country can't hear English': a guide supporting the implementation of cultural determinants of health and wellbeing with Aboriginal and Torres Strait Islander peoples. Riddell's Creek: Karabena Consulting, 2020. https://www.thecentrehki.com.au/wp-content/uploads/2020/07/Country_Cant_Hear_English_Cultural_DeterminantsGuide.pdf (viewed Mar 2021).

11 Barker C. Cultural studies: theory and practice. London: SAGE, 2003: 7.

12 Zubrzycki J, Shipp R, Jones V. Knowing, being, and doing: Aboriginal and non-Aboriginal collaboration in cancer services. *Qual Health Res* 2017; 27: 1316–1329.

13 Panaretto KS, Wenitong M, Button S, Ring IT. Aboriginal community controlled health leading the way in primary care. *Med J Aust* 2014; 200: 649–652. https://www.mja.com.au/journal/2014/200/11/aboriginal-community-controlled-health-services-leading-way-primary-care

14 Finlay S, Wenitong M. Aboriginal community controlled health organisations are taking a leading role in COVID-19 health communication. *Aust N Z J Public Health* 2020; 44: 251–252.

15 Harfield SG, Davy C, McArthur A, et al. Characteristics of Indigenous primary health care service delivery models: a systematic scoping review. *Global Health* [internet] 2018; 14: 12.

16 Streak Gomersall J, Gibson O, Dwyer J, et al. What Indigenous Australian clients value about primary health care: a systematic review of qualitative evidence. *Aust N Z J Public Health* 2017; 41: 417–423.

17 National Aboriginal Health Strategy Working Party. A national Aboriginal health strategy. Canberra: Australian Government, 1989.

18 National Aboriginal Community Controlled Health Organisation. Aboriginal Community Controlled Health Organisations (ACCHOs). https://www.naccho.org.au/acchos (viewed Mar 2021).

19 Trostle JA. Epidemiology and culture. Cambridge: Cambridge University Press, 2005.

20 Strickland C, Patrick C. Biomedical model. In: Cautin RL, Lilienfeld SO eds. The encyclopedia of clinical psychology. Hoboken: John Wiley and Sons, 2014.

21 Krieger N. Proximal, distal, and the politics of causation: what's level got to do with it? *Am J Public Health* 2008; 98: 221–230.

22 Lowitja Institute. Cultural determinants of Aboriginal and Torres Strait Islander health roundtable. Melbourne: Lowitja Institute, 2014. https://www.lowitja.org.au/content/Document/PDF/Cultural-Determinants-RT-Report-FINAL2b.pdf (viewed Mar 2021).

23 Commonwealth of Australia Department of Health. My life my lead — opportunities for strengthening approaches to the social determinants and cultural determinants of Indigenous health: report on the national consultations. Canberra: Australian Government, 2017; p 7. https://www1.health.gov.au/internet/main/publishing.nsf/content/D2F6B905F3F667DACA2580D400014BF1/$File/My%20Life%20My%20Lead%20Consultation%20Report.pdf (viewed Mar 2021).

24 Bourke S, Wright A, Guthrie J, et al. Evidence review of Indigenous culture for health and wellbeing. *Int J Health Wellness Society* 2018; 8: 11–27.

25 Salmon M, Doery K, Dance P, et al. Defining the indefinable: descriptors of Aboriginal and Torres Strait Islander peoples' cultures and their links to health and wellbeing; a literature review. Canberra: Australian National University, 2019. https://www.lowitja.org.au/content/Image/Defining_Indefinable_report_FINAL_WEB.pdf (viewed Mar 2021).

26 Yap M, Yu E. Community wellbeing from the ground up: a Yawuru example (BCEC Research Report No. 3/16). Perth: Bankwest Curtin Economics Centre, 2016. https://bcec.edu.au/publications/community-wellbeing-ground (viewed Mar 2021).

27 Lovett R, Brinckley M-M, Phillips B, et al. Marrathalpu mayingku ngiya kiyi. Minyawaa ngiyani yata punmalaka; wangaaypu kirrampili kara [In the beginning it was our people's law. What makes us well; to never be sick. Cohort profile of Mayi Kuwayu]: the National Study of Aboriginal and Torres Strait Islander Wellbeing. Canberra: Australian Institute of Aboriginal and Torres Strait Islander Studies. Australian Aboriginal Studies 2020; 2 8-30.

28 Anderson I, Baum F, Bentley M, editors. Beyond bandaids: exploring the underlying social determinants of Aboriginal health. Papers from the Social Determinants of Aboriginal Health Workshop, Adelaide, July 2004. Darwin: Cooperative Research Centre for Aboriginal Health, 2007. https://www.lowitja.org.au/content/Document/Lowitja-Publishing/BeyondBandaidsText.pdf (viewed Mar 2021).

29 Chandler MJ, Lalonde CE. Cultural continuity as a hedge against suicide in Canada's first nations. *Transcult Psychiatry* 1998; 35: 191–219.

30 Canuto KJ, Aromataris E, Burgess T, et al. A scoping review of Aboriginal and Torres Strait Islander health promotion programs focused on modifying chronic disease risk factors. *Health Promot J Austr* 2019; 32: 46–74.

31 Butler TL, Anderson K, Garvey G, et al. Aboriginal and Torres Strait Islander people's domains of wellbeing: a comprehensive literature review. *Soc Sci Med* 2019; 23: 138–157.

32 Jones R, Thurber K, Chapman J, et al. Study protocol: Our Cultures Count, the Mayi Kuwayu Study, a national longitudinal study of Aboriginal and Torres Strait Islander wellbeing. *BMJ Open* 2018; 8: e023861.

33 Sivak L, Westhead S, Richards E, et al. "Language breathes life" — Barngarla community perspectives on the wellbeing impacts of reclaiming a dormant Australian Aboriginal language. *Int J Environ Res Public Health* 2019; 16: 3918.

34 Curtis E, Jones R, Tipene-Leach D, et al. Why cultural safety rather than cultural competency is required to achieve health equity: a literature review and recommended definition. *Int J Equity Health* 2019; 18: 174.

35 Department of Health and Ageing. National Aboriginal and Torres Strait Islander Health Plan 2013–2023. Canberra: Australian Government, 2013. https://www1.health.gov.au/internet/main/publishing.nsf/content/b92e980680486c3bca257bf0001baf01/$file/health-plan.pdf (viewed Mar 2021).

36 Department of Health. Implementation plan for the National Aboriginal and Torres Strait Islander Health Plan 2013–2023. Canberra: Australian Government, 2015. https://www1.health.gov.au/internet/main/publishing.nsf/Content/AC51639D3C8CD4ECCA257E8B00007AC5/$File/DOH_ImplementationPlan_v3.pdf (viewed Mar 2021).

37 Poroch N, Arabena K, Tongs J, et al. Spirituality and Aboriginal people's social and emotional wellbeing: a review (Discussion Paper No. 11). Darwin: Cooperative Research Centre for Aboriginal Health, 2009. https://www.lowitja.org.au/content/Document/Lowitja-Publishing/DP_11_spirituality_review.pdf (viewed Mar 2021).

38 Productivity Commission. A guide to evaluation under the Indigenous Evaluation Strategy. Canberra: Australian Government, 2020. https://www.pc.gov.au/inquiries/completed/indigenous-evaluation/strategy/indigenous-evaluation-guide.pdf (viewed Mar 2021). ■

Chapter 3
Physical determinants of health: healthy, liveable and sustainable communities

Billie Giles-Corti[1], Anthony Capon[2], Annemarie Wright[3,4], Patrick Harris[5], Anna Timperio[6], Andrew Butt[1], Melanie Lowe[7], Belen Zapata-Diomedi[1], Carmel Williams[8], Tahna Pettman[8], Lucy Gunn[1]

Summary

- Good city planning is essential for protecting and improving human and planetary health. Until recently, however, collaboration between city planners and the public health sector has languished.
- We review the evidence on the health benefits of good city planning and propose an agenda for public health advocacy relating to health-promoting city planning for all by 2030.
- Over the next 10 years, there is an urgent need for public health leaders to collaborate with city planners — to advocate for evidence-informed policy, and to evaluate the health effects of city planning efforts. Importantly, we need integrated planning across and between all levels of government and sectors, to create healthy, liveable and sustainable cities for all.

The idea that city planning has a crucial role in protecting and improving human health is not new. The city planning profession emerged in the late 19th century amid efforts to protect people from infectious diseases in rapidly growing, crowded and polluted industrialising cities.[1] Health subsequently improved, thanks to separation of residential areas from noxious industries, safe water and sanitation, improved housing quality, and more public open space.

However, planning practices focused on separating land uses, coupled with increases in motor vehicle travel since the mid-20th century, encouraged the proliferation of low density, sprawling suburbs. The profound consequences of these land-use and transport planning decisions included inactive, car-dependent lifestyles that have contributed to chronic diseases, health inequities and greenhouse gas emissions.[2] Urban infrastructure investments have not benefited the outer suburbs where Australians with fewer socio-economic opportunities tend to live.[3,4] The magnitude of these decisions has become palpable in the 21st century, as cities struggle with interrelated problems: population growth, rapid urbanisation, traffic congestion, air pollution, noise, and a changing climate. Transitioning to liveable, pedestrian- and cyclist-friendly cities would help solve these problems, with co-benefits for human and planetary health.[2,5-12]

The coronavirus disease 2019 (COVID-19) pandemic has re-emphasised the impact of city planning on spatial inequalities and residents' health. Australian research has found that "With few exceptions, people living in outer- (and many middle-level) suburbs are substantially less well served than inner-city residents by … urban design, amenities and infrastructure that create liveable communities".[13] With movement restricted during mandatory lockdowns, communities lacking local amenities, public open space and active transport infrastructure were disadvantaged, as were households lacking adequate space for home-based learning and working, and residents of high-rise apartment buildings with lifts and shared facilities that impede physical distancing.

In this chapter, we first consider what the public health sector must contribute to, and advocate for, over the next 10 years to transition to health-promoting city planning for all. Second, we consider the role of the public health sector in influencing other sectors to help achieve these changes.

Public health advocacy required over the next 10 years

Mitigating and adapting to climate change

Although the COVID-19 pandemic is a significant and immediate threat, and future pandemics are likely, climate change is unquestionably the biggest threat to both human and planetary health in the coming decades.[5,6] In Australia, inequitable distribution of risk and vulnerability to climate change occurs at different scales, from buildings to neighbourhoods, and between metropolises, smaller cities and towns, and rural communities. Nevertheless, mitigating and adapting to climate change offers opportunities to improve human health.[5]

Planning for climate change must reduce people's vulnerability to heatwaves, storms, floods, droughts and bushfires. The most vulnerable households are least able to adapt to or manage the risks posed by climate change, for reasons including poor housing design, unsuitable locations, fewer financial resources, and underinsurance.[14] Strategic planning for climate crisis must include a human health focus. The public health sector must advocate for: upgrading of housing, green space and community infrastructure in vulnerable communities; stronger controls over where and how new homes are built; community programs that build social capital in risk-prone areas, in preparation for future emergencies; and targeted financial assistance following natural disasters.

Climate mitigation can bring health benefits through energy transition and efficiencies by encouraging active travel, reducing exposure to air pollution, increasing access to green infrastructure and designing homes to enhance thermal comfort. The public health sector should also advocate for building regulations that improve indoor temperature comfort and air quality, and for transport infrastructure and planning regulations that create walkable, localised neighbourhoods, which are less reliant on fossil fuel-based transport.[5]

Making the transition to sustainable transport

Australia is highly car dependent:[15] four in five Australian workers commute by private vehicle.[16] In Melbourne, for example, one-third of trips of shorter than 1 km are made by motor vehicle (driver or passenger), as are 65% of trips between 1 km and 1.9 km.[17] Decreasing car dependency requires a cultural shift, as

[1] RMIT University, Melbourne, VIC. [2] Monash Sustainable Development Institute, Monash University, Melbourne, VIC. [3] Victorian Health Promotion Foundation, Melbourne, VIC. [4] University of Melbourne, Melbourne, VIC. [5] Menzies Centre for Health Policy, University of Sydney, Sydney, NSW. [6] Institute for Physical Activity and Nutrition, Deakin University, Melbourne, VIC. [7] Australian Catholic University, Melbourne, VIC. [8] Department for Health and Wellbeing, Government of South Australia, Adelaide, SA. billie.giles-corti@rmit.edu.au • doi: 10.5694/mja2.51020

well as a supportive environment. Streets must better accommodate walking, cycling and other active transport.[18] We need well connected networks of separated bicycle lanes; reduced traffic speeds; safe and efficient pedestrian crossing points; and end-of-trip bike facilities,[19-21] particularly around transport nodes and activity centres.[22]

In Melbourne, two-thirds of all school trips are made by private transport.[23] Distance is one of the strongest barriers preventing active travel to school,[24] although fear of traffic also deters parents from allowing children to walk or cycle.[25,26] School location and zoning policies should minimise distances to school to enable active transport.[27,28] The public health sector should advocate for school zones that prioritise pedestrians and cyclists through: well connected and protected bike lanes; safe and visible crossing points; traffic-calming measures;[29,30] and reduced traffic speeds.[19,24,30,31] School drop-off zones should be located away from schools so that all children can walk for at least part of their journey, and so that safer spaces for children arriving by foot, bike or public transport are created.

Encouraging active transport often involves reclaiming road space and limiting car parking.[2] The public health sector should advocate for closing streets or reducing car access,[32] such as in low-traffic neighbourhoods in England, super blocks in Barcelona, the ciclovia in Bogota[33] and woonerfs in Europe.[34] This would create safer environments and reduce exposure to air pollution and noise.[35] Even temporarily closing streets to traffic can encourage children to engage in active play and physical activity, and foster a sense of community.[36] The COVID-19 pandemic has affirmed the need to create safer spaces for active transport,[37] and opportunities for local living.

Creating opportunities for local living

To make Australian cities liveable, and to encourage active transport for all, we need fewer low density, sprawling suburbs and more compact, higher density, mixed-use, pedestrian-friendly neighbourhoods with high quality public transport.[38] The Victorian government has proposed a city of "20-minute neighbourhoods" with essential shops and services (except employment) within a 10-minute walk from home each way.[39] New South Wales has proposed a "30-minute city", where most people have jobs, education and health facilities within a 30-minute walk or public transport trip.[40]

However, policies designed to achieve walkable neighbourhoods differ between jurisdictions. If available, they are rarely informed by evidence, fully implemented, or sufficient to achieve their stated aims.[13,41] The public health sector must advocate for consistent, evidence-informed policies and standards for dwelling density, street connectivity, and access to shops, services and public open space to achieve walkable neighbourhoods for all.[42] Evidence that could be used to inform planning policies and standards is available through the Healthy Liveable Communities Urban Liveability Checklist[43] and the Heart Foundation's Healthy Active by Design principles.[44]

Density, trees and green space

Increasing residential density through smaller lot housing in established suburbs enables more people to live in areas that are well served by local amenities and public transport. However, this requires infill development, which reduces tree canopy and green infrastructure. Combined with unsuitable building materials, this is increasing heat island effects,[45,46] reducing biodiversity and harming residents' health.

South Australia provides a case study of the unintended consequences of densification in established areas. The 30-year plan for greater Adelaide called for 85% of new housing to be built in established areas, and a 20% increase in tree canopy by 2045.[47] Although denser urban development has been achieved, the amount of impervious surfaces has increased, with significant loss of green space and tree canopy cover between 2009 and 2017.[48] Adelaide was already vulnerable to extreme temperatures,[45,46] but now 20.1% of the population of one densified municipality lives in heat islands compared with only 5.6% in a neighbouring municipality that did not densify.[48]

In established areas, creating more public open space alone cannot replace loss of green canopy on private land,[49] as there is insufficient available public land to compensate.[50] The public health sector should advocate for private landowners and developers to retain or provide green infrastructure.[51] Health professionals must work with planners to achieve a better balance between individual landowner rights, policies seeking to increase urban density, and community health.

Rethinking work and outer suburban and regional communities

The rapid transition to working from home during the COVID-19 pandemic caused a transition to long mooted, but yet unrealised, telecommuting, and decentralised, multicentred cities and city networks. In Australia, working from home has proved popular, with almost one in three surveyed Victorian workers wanting to continue this after the pandemic.[12] Suburbanisation and regionalisation of knowledge-based work could have major implications for where people live, transportation systems, and the provision of local amenities.

Greater emphasis is being placed on suburban centres and regions hosting more diverse employment.[52] Further consideration should therefore be given to the local amenities needed by people working from home, including active transport, local shops and services, and open space. This could help reduce the need to travel, and reduce health inequalities between central city and outer suburban and regional areas.[53,54]

At state and local levels, the public health sector should support city planners to implement policies such as the 20-minute neighbourhood. Nationally, the sector should advocate for flexible working arrangements to help reverse the dominance of metropolitan cities. However, there is also a need for greater investment in social, communications and transport infrastructure that enables people in outer suburban and regional communities to work from or near home.

Infrastructure

Infrastructure underpins healthy liveable communities,[55] and is fundamental for a strong economy, especially in times of crisis.[56] Infrastructure investment can bring co-benefits: for instance, clean transport and energy improve health, and also improve socio-economic and environmental sustainability. To rebuild the economy after the COVID-19 pandemic, the public health sector should advocate for investments that support equitable access to healthy, liveable and sustainable cities and neighbourhoods.[57] For example, to facilitate working from home and distributed employment locations in outer suburbs and regions, stimulus spending should focus on infrastructure consistent with the implementation of the 20-minute neighbourhood. This includes: upgrading and building more social and affordable housing; investing in world-class digital infrastructure to foster connectivity and productivity; prioritising cycling and urban greening on transport

corridors; and building pedestrian and cycling infrastructure. These investments would future-proof communities by enabling more people to live in regional areas, reducing traffic congestion, and enhancing liveability, sustainability and equity.

How can the health sector influence other sectors?

Advocating for evidence-informed urban and transport policy and planning

To build healthy, liveable and sustainable cities, Australia needs policy-relevant evidence.[58] Monitoring policy implementation, including spatial inequalities and impacts on health, can contribute to evidence-informed policy making.[13,41] For example, inadequate infrastructure for active and public transport may increase road injuries and exposure to air pollution,[59] imposing an economic burden on individuals and societies.[60,61] Data are required to measure the effects of urban planning, progress in implementing health-promoting policies,[13,41] and reductions in spatial inequalities.[62] Spatial data can be used to assess strategies to ameliorate urban heat islands, increase urban greening,[49] or to map transportation poverty.[63]

For example, recent Australian research mapped policy-relevant liveability indicators that identified spatial inequalities in access to health-promoting environments.[13,64] Liveability indicators for Australia's 21 largest cities, now available through the Australian Urban Observatory,[65] can be used to inform policies, municipal plans and local interventions. They can be used alongside health impact assessment tools, which predict the health impacts of transport and urban planning proposals.[66,67] The public health sector should argue for the use of such evidence, and for health impacts to be considered in all land-use and transport planning decisions.

Research and its dissemination must be attuned to urban policy-making processes.[64] To translate research into action, collaborations between researchers and policy makers are needed, as one of the best predictors of research informing policy and practice is co-production and contact between decision makers and researchers.[58,68,69] The health sector can facilitate partnerships with researchers, including those from non-health disciplines, and co-fund evaluations of the health impacts of land-use and transport-planning interventions.

Advocating for integrated city planning and multidisciplinary leadership

The complex challenges of urban life extend beyond narrow practice and policy responses, which have reinforced inequities in urban liveability in Australian cities.[70] Healthy, equitable and sustainable cities require integrated planning between sectors and levels of government.[71-73] Horizontal integration is needed between urban planning, transport, employment, housing, social infrastructure and services, and open space. Policy decisions in these sectors determine how cities develop, thus influencing residents' transport choices, lifestyles and health-related environmental exposures.[2] On the other hand, vertical integration between federal, state and local governments is required to align planning frameworks and investment. Although urban planning has tended to be a state and local government responsibility in Australia, the federal government has recently taken an active role by fostering vertical integration.[74] The federal City Deals initiative aims to develop a shared vision for liveable cities and accelerate reform and investment through partnerships between the three levels of government and the community.[74]

Such horizontal and vertical integration needs transformational leadership and changes to systems. Although many public health professionals understand the need to work across sectors, this level of intersectoral action will not happen without a mandate. The public health sector should advocate for: an integrated governance framework for cross-sector collaboration; formalisation of shared accountability and responsibility; and creation of shared priorities, reporting mechanisms and organisational behaviours and norms. It is the role of central government agencies to establish the horizontal and vertical structures and cultural expectations necessary for collaboration across and between levels of government. Leadership by governments at each tier of their bureaucracies is vital for creating the authorising environment for intersectoral action.

The public health sector could play a vital role in making health integral to land-use and transport planning.[75-77] A central advocacy goal must be that health promotion becomes an explicit objective in all land-use legislation, so that health is considered in all subordinate regulations, policies and local planning decisions.[78] Local government, being closest to communities, has a particularly important role in creating healthy and equitable spaces and places.[79,80] However, state-level planning policies, regulations and legislation must support rather than thwart local efforts. Specific evidence-informed standards and measurable targets are needed to move us beyond mere aspirations for healthy cities, and towards accountable policy implementation.[3]

The health sector must advocate for these reforms and provide practical, evidence-based tools with the potential for public health benefit.[81] For example, the US Centers for Disease Control and Prevention's Active Communities Tool[82] is an action planning guide that helps cross-sector teams develop action plans for improving local built environments. In Australia, the Heart Foundation's Healthy Active By Design website[44] publishes reviews of built-environment interventions.

Finally, leadership by urban planning, transport and public health academics and professional associations is essential. They must educate the next generation of professionals to understand the complexities of creating healthy, liveable and sustainable cities, and break down professional and sector silos.[2] Place-based, collaborative and interdisciplinary tertiary education offers a means to do this while still meeting graduates' needs for specific knowledge and expertise.

Conclusion

Designing cities that facilitate healthy, sustainable lifestyles is a global priority, with the COVID-19 pandemic underscoring the importance of fostering local living. Advocating for the design of healthy, liveable and sustainable cities *for all* by 2030 requires a rethink of the way we build cities and towns. Critically, it needs a skilled public health workforce backed by a supportive authorising environment that enables horizontally and vertically integrated planning that can respond to the many health problems confronting cities, including pandemics, chronic disease and climate change. The public health sector has a unique role to play — it can advocate for evidence-informed and integrated city planning for all; benchmark and monitor city planning to identify unintended harms and spatial inequalities in policy implementation; and assess the health impacts of planning decisions. Good city planning benefits health, the environment and the economy. However, achieving this vision will require leadership

from all levels and sectors of government, and professional associations and disciplines.

Acknowledgements: This chapter is part of a supplement funded by the Victorian Health Promotion Foundation (VicHealth). VicHealth is a pioneer in health promotion. It was established by the Victorian Parliament as part of the *Tobacco Act 1987* and has a primary focus on promoting good health for all and preventing chronic disease. Billie Giles-Corti is supported by a National Health and Medical Research Council (NHMRC) Senior Principal Research Fellowship (1107672), Belen Zapata-Diomedi by an RMIT Vice-Chancellor's Research Fellowship, and Lucy Gunn by the NHMRC-funded Australian Prevention Partnership Centre (9100003). We gratefully acknowledge the editorial advice provided by Belinda Nemec.

Competing interests: No relevant disclosures.

Provenance: Commissioned; externally peer reviewed. ■

How to cite this chapter: Giles-Corti B, Capon A, Wright A, et al. Physical determinants of health: healthy, liveable and sustainable communities. *Med J Aust* 2020; 214 (8 Suppl): S17–S21.

1 Corburn J. Reconnecting with our roots: American urban planning and public health in the twenty-first century. *Urban Aff Rev* 2007; 42: 688–713.

2 Giles-Corti B, Vernez-Moudon A, Reis R, et al. City planning and population health: a global challenge. *Lancet* 2016; 388: 2912–2924.

3 Lowe M, Arundel J, Hooper P, et al. Liveability aspirations and realities: implementation of urban policies designed to create healthy cities in Australia. *Soc Sci Med* 2020; 245: 112713.

4 McGreevy M, Harris P, Delaney-Crowe T, et al. How well do Australian government urban planning policies respond to the social determinants of health and health equity? *Land Use Policy* 2020; 99: 105053.

5 Watts N, Adger WN, Agnolucci P, et al. Health and climate change: policy responses to protect public health. *Lancet* 2015; 386: 1861–1914.

6 Swinburn BA, Kraak VI, Allender S, et al. The global syndemic of obesity, undernutrition, and climate change: the Lancet Commission report. *Lancet* 2019; 393: 791–846.

7 Chandrabose M, Rachele JN, Gunn L, et al. Built environment and cardio-metabolic health: systematic review and meta-analysis of longitudinal studies. *Obes Rev* 2019; 20: 41–54.

8 Sarkar C, Webster C, Gallacher J. Neighbourhood walkability and incidence of hypertension: findings from the study of 429,334 UK Biobank participants. *Int J Hyg Environ Health* 2018; 221: 458–468.

9 Sarkar C, Webster C, Gallacher J. Residential greenness and prevalence of major depressive disorders: a cross-sectional, observational, associational study of 94 879 adult UK Biobank participants. *Lancet Planet Health* 2018; 2: e162–e173.

10 Sarkar C. Residential greenness and adiposity: findings from the UK Biobank. *Environ Int* 2017; 106: 1–10.

11 Higgs C, Badland H, Simons K, et al. The Urban Liveability Index: developing a policy-relevant urban liveability composite measure and evaluating associations with transport mode choice. *Int J Health Geogr* 2019; 18: 14.

12 VicHealth. VicHealth coronavirus Victorian wellbeing impact study. Sep 2020. https://www.vichealth.vic.gov.au/-/media/ResourceCentre/PublicationsandResources/General/VicHealth-Coronavirus-Impact-Study-infographic-media-pack-FINAL.pdf (viewed Feb 2021).

13 Arundel J, Lowe M, Hooper P, et al. Creating liveable cities in Australia: mapping urban policy implementations and evidence-based national liveability indicators. Melbourne: RMIT University, 2017. https://cloudstor.aarnet.edu.au/plus/index.php/s/CJ4t5N3SFCOZTWP (viewed Feb 2021).

14 Booth K, Tranter B. When disaster strikes: under-insurance in Australian households. *Urban Studies* 2018; 55: 3135–3150.

15 Stock P, Steffen W, Bourne G, Brailsford L. Waiting for the green light: transport solutions to climate change. Climate Council of Australia, 2018. https://www.climatecouncil.org.au/wp-content/uploads/2018/10/CC_MVSA0154-Report-Transport_V6-FA_Low-Res_Single-Pages.pdf (viewed Feb 2021).

16 Cooper J, Corcoran J. Journey to work in Australia. In: Census of population and housing: commuting to work — more stories from the census, 2016 (ABS Cat. No. 2071.0.55.001). Canberra: ABS. 2018. https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/2071.0.55.001~2016~Main%20Features~Feature%20Article:%20Journey%20to%20Work%20in%20Australia~40 (viewed Feb 2021).

17 Eady J, Burtt D. Walking and transport in Melbourne suburbs. Melbourne: Victoria Walks, 2019. https://www.victoriawalks.org.au/Assets/Files/Walking%20%20transport%20FINAL.pdf (viewed Feb 2021).

18 Stevenson M, Thompson J, de Sa TH, et al. Land use, transport, and population health: estimating the health benefits of compact cities. *Lancet* 2016; 388: 2925–2935.

19 Burke M, Stanley J, Duncan M, et al. Active area 4: active transport. In: Heart Foundation of Australia. editor. Blueprint for an active Australia. 3rd ed. Melbourne: Heart Foundation of Australia, 2019: 34-41.

20 Department for Transport. Gear change: a bold vision for cycling and walking. London: Department for Transport, 2020. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/904146/gear-change-a-bold-vision-for-cycling-and-walking.pdf (viewed Feb 2021).

21 Winters M, Buehler R, Gotschi T. Policies to promote active travel: evidence from reviews of the literature. *Curr Environ Health Rep* 2017; 4: 278–285.

22 Giles-Corti B, Eagleson S, Lowe M. Securing Australia's future — sustainable urban mobility. The public health impacts of transportation decisions. Melbourne: Australian Council of Learned Academies, 2014. http://acola.org.au/wp/PDF/SAF08/Health%20Consultancy.pdf (viewed Feb 2021).

23 Department of Transport. Victorian integrated survey of travel and activity (VISTA). 2019. https://public.tableau.com/profile/vista#!/vizhome/VISTA-JourneytoeducationAccess/JTE-methodoftravel (viewed Feb 2021).

24 Timperio A, Ball K, Salmon J, et al. Personal, family, social, and environmental correlates of active commuting to school. *Am J Prev Med* 2006; 30: 45–51.

25 Trapp GS, Giles-Corti B, Christian HE, et al. On your bike! A cross-sectional study of the individual, social and environmental correlates of cycling to school. *Int J Behav Nutr Phys Act* 2011; 8: 123.

26 Trapp GS, Giles-Corti B, Christian HE, et al. Increasing children's physical activity: individual, social, and environmental factors associated with walking to and from school. *Health Educ Behav* 2012; 39: 172–182.

27 Marshall JD, Wilson RD, Meyer KL, et al. Vehicle emissions during children's school commuting: impacts of education policy. *Environ Sci Technol* 2010; 44: 1537–1543.

28 Giles-Corti B, Wood G, Pikora T, et al. School site and the potential to walk to school: the impact of street connectivity and traffic exposure in school neighborhoods. *Health Place* 2011; 17: 545–550.

29 McDonald NC. Children's mode choice for the school trip: the role of distance and school location in walking to school. *Transportation* 2008; 35: 23–35.

30 Carver A, Barr A, Singh A, et al. How are the built environment and household travel characteristics associated with children's active transport in Melbourne, Australia? *J Transp Health* 2019; 12: 115–129.

31 Audrey S, Batista-Ferrer H. Healthy urban environments for children and young people: a systematic review of intervention studies. *Health Place* 2015; 36: 97–117.

32 Glazener A, Khreis H. Transforming our cities: best practices towards clean air and active transportation. *Curr Environ Health Rep* 2019; 6: 22–37.

33 Torres A, Sarmiento O, Stauber C, et al. The ciclovia and cicloruta programs: promising interventions to promote physical activity and social capital in Bogota, Colombia. *Am J Public Health* 2013; 103: e23–e30.

34 Ben-Joseph E. Changing the residential street scene: adapting the shared street (woonerf) concept to the suburban environment. *J Am Plann Assoc* 1995; 61: 504–515.

35 Mueller N, Rojas-Rueda D, Khreis H, et al. Changing the urban design of cities for health: the superblock model. *Environ Int* 2020; 134: 105132.

36 Umstaddt Meyer MR, Bridges CN, Schmid TL, et al. Systematic review of how Play Streets impact opportunities for active play, physical activity, neighbourhoods, and communities. *BMC Public Health* 2019; 19: 335.

37 Adlakha D, Sallis JF. Activity-friendly neighbourhoods can benefit non-communicable and infectious diseases. *Cities Health* 2020; https://doi.org/10.1080/23748834.2020.1783479 [online ahead of print].

38 Western Australian Planning Commission. Liveable neighbourhoods: a Western Australian Government sustainable cities initiative. Perth: Western Australian Planning Commission, 2009. https://www.dplh.wa.gov.au/getmedia/1fc06abe-fc35-4c68-a7c6-ebc3007a62ac/FUT_LN_Liveable_Neighbourhoods_update_02 (viewed Feb 2021).

39 Department of Environment, Land, Water and Planning. 20-minute neighbourhoods: creating a more liveable Melbourne. Melbourne: DELWP, 2019. https://www.planmelbourne.vic.gov.au/__data/assets/pdf_file/0018/515241/Creating-a-more-liveable-Melbourne.pdf (viewed Feb 2021).

40 Greater Sydney Commission. Greater Sydney region plan: a metropolis of three cities. Sydney: State of New South Wales, 2018. https://gsc-public-1.s3-ap-southeast-2.amazonaws.com/greater-sydney-region-plan-0618.pdf?pMbPYxwen5IHg4GSB6td4yKiKVogFi4c (viewed Feb 2021).

41 Hooper P, Giles-Corti B, Knuiman M. Evaluating the implementation and active living impacts of a state government planning policy designed to create walkable neighborhoods in Perth, Western Australia. *Am J Health Promot* 2014; 28: S5–S18.

42 Hooper P, Knuiman M, Foster S, et al. The building blocks of a 'liveable neighbourhood': identifying the key performance indicators for walking of an operational planning policy in Perth, Western Australia. *Health Place* 2015; 36: 173–183.

43 Badland H, Higgs C, Giles-Corti B. The healthy liveable communities urban liveability checklist. Melbourne: RMIT University, 2019. https://cur.org.au/cms/wp-content/uploads/2019/10/urban_livability_checklist4pp-a3-aw-002.pdf (viewed Feb 2021).

44 Heart Foundation. Healthy Active by Design [website]. https://www.healthyactivebydesign.com.au (viewed Feb 2021).

45 Ossola A, Staas L, Leishman M. Urban trees and people's yards mitigate extreme heat in western Adelaide. Sydney: Macquarie University, 2020. https://research-management.mq.edu.au/ws/portalfiles/portal/113138181/Urban_trees_and_peoples_yards_mitigate_extreme_heat_in_Western_Adelaide_28.01.2020.pdf (viewed Feb 2021).

46 Amati M, Boruff B, Caccetta P, et al. Where should all the trees go? Melbourne: RMIT University, 2017. https://202020vision.com.au/media/162691/wsattg_combined-lr.pdf (viewed Feb 2021).

47 Department of Planning, Transport and Infrastructure. The 30-year plan for Greater Adelaide: 2017 update. Adelaide: DPTI, 2017. https://livingadelaide.sa.gov.au/__data/assets/pdf_file/0003/319809/The_30-Year_Plan_for_Greater_Adelaide.pdf (viewed Feb 2021).

48 Seed Consulting Services. Western Adelaide urban heat mapping project report. 2017. https://www.adaptwest.com.au/sites/adaptwest/media/pdf/western_adelaide_urban_heat_mapping_report-(2).pdf (viewed Feb 2021).

49 Saunders A, Duncan J, Hurley J, et al. Leaf my neighbourhood alone! Predicting the influence of densification on residential tree canopy cover in Perth. *Landsc Urban Plan* 2020; 199: 103804.

50 Conservation SA. What's happening to Adelaide's trees? 2020. https://www.edo.org.au/wp-content/uploads/2020/08/Whats-happening-to-Adelaides-trees_-June-2020-print-no-markups-1-1.pdf (viewed Feb 2021).

51 Government of South Australia, Australian Institute of Landscape Architects SA Chapter. Creating greener places for healthy and sustainable communities: ideas for quality green public space in South Australia. Adelaide: Government of South Australia, 2019. https://www.odasa.sa.gov.au/wp-content/uploads/Green-Public-Spaces-Principles-FIN-WEB-V3.pdf (viewed Feb 2021).

52 Department of Environment, Land, Water and Planning. Plan Melbourne 2017–2050: metropolitan planning strategy. Melbourne: DELWP, 2017. https://www.planmelbourne.vic.gov.au/__data/assets/pdf_file/0007/377206/Plan_Melbourne_2017-2050_Strategy_.pdf (viewed Feb 2021).

53 Gunn L, Davern M, Higgs C, et al. Measuring liveability for the 21 largest cities in Australia: liveability report for Melbourne. Melbourne: RMIT University, 2020. https://auo.org.au/wp-content/uploads/2020/03/AUO_Scorecard_Melbourne.pdf (viewed Feb 2021).

54 Badland H, Pearce J. Liveable for whom? Prospects of urban liveability to address health inequities. *Soc Sci Med* 2019; 232: 94–105.

55 Stanley J, Stanley J, Hansen R. How great cities happen: integrating people, land use and transport. 1st ed. Cheltenham: Edward Elgar Publishing, 2017.

56 Infrastructure Australia. An assessment of Australia's future infrastructure needs: the Australian infrastructure audit 2019. Sydney: Infrastructure Australia, 2019. https://www.infrastructureaustralia.gov.au/sites/default/files/2019-08/Australian%20Infrastructure%20Audit%202019.pdf (viewed Feb 2021).

57 Harris P, Riley E, Dawson A, et al. "Stop talking around projects and talk about solutions": positioning health within infrastructure policy to achieve the sustainable development goals. *Health Policy* 2020; 124: 591–598.

58 Giles-Corti B, Sallis JF, Sugiyama T, et al. Translating active living research into policy and practice: one important pathway to chronic disease prevention. *J Pub Health Policy* 2015; 36: 231–243.

59 Schepers P, Lovegrove G, Helbich M. Urban form and road safety: public and active transport enable high levels of road safety. In: Nieuwenhuijsen M, Khries H eds. Integrating human health into urban and transport planning: a framework. Cham: Springer, 2019: 383–408.

60 Gunn L, Kroen A, De Gruyter C, et al. Early delivery of equitable and healthy transport options in new suburbs: policy, place and people. *J Transp Health* 2020; 18: 100870.

61 Currie G, Delbosc A. Mobility vs. affordability as motivations for car-ownership choice in urban fringe, low-income Australia. In: Lucas K, Blumenberg E, Weinberger R eds. Auto motives: understanding car use behaviours. Bingley: Emerald Group Publishing, 2011: 193–208.

62 World Health Organization, United Nations Human Settlements Programme. Hidden cities: unmasking and overcoming health inequities in urban settings. Kobe: WHO, 2010. https://apps.who.int/iris/bitstream/handle/10665/44439/9789241548038_eng.pdf?sequence=1&isAllowed=y (viewed Feb 2021).

63 Dodson J, Sipe N. Shocking the suburbs: urban location, home ownership and oil vulnerability in the Australian city. *Housing Studies* 2008; 23: 377–401.

64 Lowe M, Hooper P, Jordan H, et al. Evidence-informed planning for healthy liveable cities: how can policy frameworks be used to strengthen research translation? *Curr Environ Health Rep* 2019; 6: 127–136.

65 Australian Urban Observatory [website]. https://auo.org.au (viewed Feb 2021).

66 Kahlmeier S, Götschi T, Cavill N, et al. Health economic assessment tool (HEAT) for walking and for cycling. Copenhagen: World Health Organization, 2017. https://www.euro.who.int/__data/assets/pdf_file/0010/352963/Heat.pdf (viewed Feb 2021).

67 Harris P, Spickett J. Health impact assessment in Australia: a review and directions for progress. *Environ Impact Assess Rev* 2011; 31: 425–432.

68 Gagliardi AR, Berta W, Kothari A, et al. Integrated knowledge translation (IKT) in health care: a scoping review. *Implement Sci* 2016; 11: 38.

69 Taylor EJ, Hurley J. "Not a lot of people read the stuff": Australian urban research in planning practice. *Urban Pol Res* 2016; 34: 116–131.

70 Sanchez KA, Khreis H. The role of cross-disciplinary education, training, and workforce development at the intersection of transportation and health. In: Nieuwenhuijsen MJ, Khreis H eds. Advances in transportation and health: tools, technologies, policies, and developments. Amsterdam: Elsevier, 2020: 423–450.

71 Lowe M, Whitzman C, Giles-Corti B. Health-promoting spatial planning: approaches for strengthening urban policy integration. *Plan Theory Pract* 2018; 19: 180–197.

72 Kidd S. Towards a framework of integration in spatial planning: an exploration from a health perspective. *Plan Theory Pract* 2007; 8: 161–181.

73 Carmichael L, Barton H, Gray S, et al. Health-integrated planning at the local level in England: impediments and opportunities. *Land Use Policy* 2013; 31: 259–266.

74 Department of the Prime Minister and Cabinet. Smart cities plan. Canberra: Commonwealth of Australia, 2016. https://www.infrastructure.gov.au/cities/smart-cities/plan/files/Smart_Cities_Plan.pdf (viewed Feb 2021).

75 Harris P, Kent J, Sainsbury P, et al. Healthy urban planning: an institutional policy analysis of strategic planning in Sydney, Australia. *Health Promot Int* 2019; 35: 649–660.

76 McGreevy M, Harris P, Delaney-Crowe T, et al. The power of collaborative planning: how a health and planning collaboration facilitated integration of health goals in the 30-year plan for greater Adelaide. *Urban Pol Res* 2020; 38: 1–14.

77 McQueen D, Wismar M, Lin V eds. Intersectoral governance for health in all policies: structures, actions and experiences. Copenhagen: World Health Organization, 2012.

78 Harris P, Kent J, Sainsbury P, et al. Creating 'healthy built environment' legislation in Australia: a policy analysis. *Health Promot Int* 2017; 33: 1090–1100.

79 Browne GR, Davern M, Giles-Corti B. 'Punching above their weight': a qualitative examination of local governments' organisational efficacy to improve the social determinants of health. *Aust N Z J Public Health* 2019; 43: 81–87.

80 Gibbs L, Peeters A. Where do we go next with prevention? Adopting a transilient approach as we learn from coronavirus. Melbourne: VicHealth, 2020. https://www.vichealth.vic.gov.au/-/media/Life-and-Health-Re-imagined---Where-do-we-go-next-with-prevention-(1)/Life-and-Health-Re-imagined---Where-do-we-go-next-with-prevention-Jul2020.pdf?la=en&hash=5E6A6EF32B98E1D4506B811C6A94D1329CB1EAFF (viewed Feb 2021).

81 Powell BJ, Fernandez ME, Williams NJ, et al. Enhancing the impact of implementation strategies in healthcare: a research agenda. *Front Public Health* 2019; 7: 3.

82 Centers for Disease Control and Prevention. The active communities tool action planning guide. Atlanta: CDC, 2019. https://www.cdc.gov/physicalactivity/community-strategies/active-communities-tool/pdf/active-communities-toolkit-action-planning-guide-508.pdf (viewed Feb 2021). ■

Chapter 4
Health promotion in the Anthropocene: the ecological determinants of health

Rebecca Patrick[1], Fiona Armstrong[2], Anthony Capon[3], Kathryn Bowen[4], Selina N Lo[3,5], Aileen Thoms[6]

Summary

- Human health is inextricably linked to the health of the natural environment. In this chapter, we focus on ecological determinants of health, including the urgent and critical threats to the natural environment, and opportunities for health promotion arising from the human health co-benefits of actions to protect the health of the planet.
- We characterise ecological determinants in the Anthropocene and provide a sobering snapshot of planetary health science, particularly the momentous climate change health impacts in Australia. We highlight Australia's position as a major fossil fuel producer and exporter, and a country lacking cohesive and timely emissions reduction policy.
- We offer a roadmap for action, with four priority directions, and point to a scaffold of guiding approaches — planetary health, Indigenous people's knowledge systems, ecological economics, health co-benefits and climate-resilient development. Our situation requires a paradigm shift, and this demands a recalibration of health promotion education, research and practice in Australia over the coming decade.

The *Waiora — Indigenous peoples' statement for planetary health and sustainable development* states: "Understanding our place in the natural world in relational ways leads us to consider how access to the natural environment shapes human health and wellbeing, the impacts of our activities on the environment, and our inalienable collective responsibilities of stewardship which will benefit future generations".[1] Human health is inextricably linked to the life-giving resources and ecological processes of a healthy natural environment. Indigenous communities have lived in harmony with their natural environments for millennia. The basic requirements for human health are oxygen, water, food, fuel and shelter, which are all derived from the natural world. Sometimes referred to as ecosystem "goods and services", natural resources and ecological processes that sustain human health include clean air, fertile soils, fresh water, marine aquatic systems, plants and animals.[2,3] The ozone layer protects the earth from ultraviolet radiation, the atmosphere regulates temperature and climate, nitrogen and phosphorus cycles circulate nutrients for plant growth, and ecosystems detoxify waste and help regulate disease arising from vectors, pests and pathogens.[2,4,5] Biodiversity underpins all of these ecosystem services. The natural world provides the basic resources on which civilisation depends (eg, energy, food, raw materials and regulation against disease) plus psychosocial, cultural, spiritual and recreational benefits associated with human connection to nature, place and country.[5–7] Together, these natural resources and ecological processes constitute the ecological determinants of health.

Health promotion's role in recognising and acting on ecological determinants is recognised in several significant international declarations[8] However, despite these calls for action, health promotion practice incorporating ecological determinants has been slow to develop.[9] Barriers to engagement with ecological determinants in the health promotion sector include: normative barriers (the sector operates in dominant western paradigms such as economic growth); structural barriers (health promoters are embedded in organisations that do not recognise ecological determinants); disciplinary barriers (the sector operates in a medical or illness model and is chronically under-resourced); and barriers relating to theoretical limitation (predominately social sciences). These barriers have resulted in a focus on social determinants and equity, relying on behaviour change interventions and narrow systems of measuring health outcomes, while ignoring ecological issues.[10,11]

Australia is a major producer and exporter of fossil fuels (coal, gas and oil), which make up 3.6% of total global emissions. If added to our domestic greenhouse gas emissions, Australia's total greenhouse gas emissions would be equivalent to those of Russia, the world's fifth biggest carbon dioxide emitter.[12] While the value of these exports is set to decline, the fossil fuel industry remains a powerful and persuasive commercial force in Australian politics and policy making. As a result, Australia has no cohesive national climate policy and the country has the unenviable track record of failing to meet responsibilities under the Paris Agreement.[13,14] Employment has been tethered to the industry narrative of continued investment in fossil fuels, despite fossil fuel energy infrastructure providing fewer jobs per unit of energy produced than renewables.[15] As well as the climate-related and environmental damages associated with fossil fuel extraction, there are social and cultural harms from extraction on Aboriginal and Torres Strait Islander traditional lands and desecration of sacred sites. Continued investment in and policy support for fossil fuel use is in conflict with scientific evidence, public health expertise, warnings from Indigenous elders, and financial and legal advice about the risks and opportunities presented by climate change.[16]

With the nation warming faster than the global average, Australia faced a unique dual challenge in 2020, with social, ecological, economic and health systems tested by bushfires and the coronavirus disease 2019 (COVID-19) pandemic. The COVID-19 pandemic is widely understood to be related to ecological disruption and exacerbated by climate change. Action on both must form part of the way forward.[17,18] Australia has an opportunity to apply an evidence-based approach to recovery, as it has done during the pandemic, that will also address the ecological determinants.[19] It is well positioned to do so, with abundant sources of renewable energy, and industry capacity across energy, transport, agriculture and infrastructure to scale up net zero emissions technologies and strategies.[20]

[1] Deakin University, Geelong, VIC. [2] Climate And Health Alliance, Melbourne, VIC. [3] Monash Sustainable Development Institute, Monash University, Melbourne, VIC. [4] Climate Change Institute, Australian National University, Canberra, ACT. [5] The Lancet, London, UK. [6] Kooweerup Regional Health Service, Koo Wee Rup, VIC. rebecca.patrick@deakin.edu.au • doi: 10.5694/mja2.51020

Life in the Anthropocene

The Anthropocene is a new geological epoch (associated with mid-20th century industrialisation) in which humans constitute the dominant force on the planet — disrupting the climate system and damaging earth systems. Human activities are driving ecosystem decline through population growth, rapid urbanisation, economic growth, industrialisation, technological advancements and sociocultural changes.[2,21] In the 21st century, the impact of the Anthropocene and breaches of planetary boundaries pose the greatest threat to the health of the human and non-human populations.[21,22]

The planetary boundaries concept identifies nine planetary boundaries — biosphere integrity, land-system change, freshwater use, biogeochemical flows, ocean acidification, atmospheric aerosol load, stratospheric ozone depletion, novel entities and climate change — within which civilisation must operate to be safe and to flourish. Breaching planetary boundaries increases the risk of broad ranging, abrupt, cascading and/or irreversible environmental changes[23,24] and profound disruption to the ecological determinants. It has been observed that several planetary boundaries have already been crossed, and we are currently experiencing human health impacts of the Anthropocene.[5,22] These impacts include: climate change and atmospheric change, which are major sources of air pollution;[5,22] resource depletion and overconsumption, which undermine food production;[5] ocean acidification, which has adverse effects on marine species;[25] and biodiversity loss, which increases risk of infectious diseases (eg, COVID-19) and threatens resources for human medicines.[5,26]

The Australian population is already experiencing many and varied acute, subchronic and chronic health effects of climate change.[27] The catastrophic bushfires on Australia's eastern seaboard during the summer of 2019–2020 were fuelled by ongoing drought, extreme heat, low rainfall and strong winds — conditions arising from climate change.[28] About 80% of Australians were affected either directly or indirectly by the bushfires;[28] as a direct result of the bushfires, 33 people died, 3094 homes were lost, more than 17 million hectares of land was burnt, and over 1 billion mammals, birds and reptiles died.[29] It has been estimated that smoke from the 2019–2020 summer bushfires was responsible for 417 excess deaths, 1124 hospitalisations for cardiovascular problems, 2027 hospitalisations for respiratory problems, and 1305 emergency department presentations for asthma.[30] The health costs of bushfire smoke were estimated at $1.95 billion.[31] Data on mental health outcomes are not as readily available, but evidence from previous bushfires (eg, Black Saturday in 2009) suggest acute and long term mental health impacts including post-traumatic stress disorder, depression, alcohol use and psychological distress.[32]

Climate change and bushfires disproportionately affect vulnerable people, including children, pregnant women, older people and people with chronic illnesses.[33] Indigenous people are twice as likely as non-Indigenous people to be adversely affected by fires, with impacts including trauma from the destruction of lands and water, and trauma from severed connections to native flora and fauna.[34] Similarly, Australia's Pacific Island neighbours are already suffering from significant impacts of climate chnage.[35]

While the scale and urgency required to tackle climate change and ecological degradation is escalating, there is strong evidence that addressing climate change and planetary health issues could be the "greatest global health opportunity of the 21st century".[36] Health promotion leadership and action will be critical.

Health promotion in the Anthropocene — a roadmap for action

This is the critical decade. Without strong commitments to drastic emissions reductions, the ecological and climate-driven public health emergency will result in immense disruptions to everyday life. The next 10 years requires health promoters to join forces with existing initiatives and take carriage of an agenda with four priority directions.

Direction 1: Advocate for an urgent transition to sustainable ways of living, including rapid decarbonisation of the economy

Influencing Australia's actions on fossil fuel development and decarbonising the economy are the most urgent and far reaching challenges for this decade.[16] Health promoters need to lobby and advocate for disinvestment in fossil fuels and rapid transition to a 100% renewable energy economy. Drawing on the lessons of successfully disrupting the tobacco industry, health promoters can apply their skills in intersectoral action and policy advocacy to support wider efforts to prevent fossil fuel investment in Australia. Likewise, health promoters can participate in decarbonisation efforts in the sectors in which they are already embedded. For example, promoting localised and plant-based food systems has the dual benefit of supporting sustainable, just and healthy lifestyles and reducing the carbon footprint of the food system. Another area of influence, the health care sector, accounts for 7% of Australia's greenhouse gas emissions.[37] Health promoters can use their stakeholder engagement capabilities to foster organisational commitments to net zero emissions and decarbonised health care delivery. They can use their purchasing power to reorientate the health care supply chain toward carbon neutral operations, including decarbonised superannuation and foundations.[15]

Case study 1. Foundations for health-promoting public policy that reduce greenhouse gas emissions have already been laid in Australia. The Climate and Health Alliance led a national consultation with health care stakeholders which underpinned the development of a roadmap for integrated climate–health policy, titled the *Framework for a national strategy on climate, health and well-being for Australia*. This roadmap was presented to federal parliament in 2017 and has subsequently informed local and state government policy, including in Queensland. The roadmap prioritises health-promoting emissions reduction policies as a key co-benefit policy action at all levels of government, and a climate-resilient, environmentally sustainable health care sector.[38] It demonstrates the application of health promotion principles and strategies in policy design and advocacy efforts to reduce emissions, promote health and decarbonise systems.

Direction 2: Integrate planetary health, Indigenous knowledge systems, ecological economics, health co-benefits and climate resilience into health promotion frameworks

Current health promotion frameworks are inadequately geared toward ecological determinants and will not meet the demands of rapid transition. Here we offer essential guiding approaches for revising health promotion frameworks to support a paradigm shift.

Planetary health. Planetary health is premised on the understanding that human health and the health of our planet are inextricably linked, and civilisation depends on flourishing

natural systems and wise stewardship of natural resources.[39,40] This was the guiding theme of the 23rd IUHPE World Conference on Health Promotion (run by the International Union for Health Promotion and Education [IUHPE]), which focused on promoting planetary health and sustainable development for all. Adoption of this approach requires a reset in health promotion practice and an expansion of the current human health equity focus to one of intergenerational planetary health equity.

Indigenous peoples' knowledge systems. Planetary health builds on Indigenous peoples' knowledge systems and principles of holism and interconnectedness.[41] While recognising that Indigenous peoples are diverse and that world views are specific to people and place, at the core of Indigenous knowledge systems is collective responsibility for the stewardship and appreciation of earth as a living entity, and connection to country or place as essential for wellbeing.[1,41] Indigenous peoples' knowledge systems provide a critical alternative to prevailing western and environmentally destructive paradigms characterised by individualism, capitalism and anthropocentrism.[36] Engaging with and privileging Indigenous knowledge systems in health promotion will build effective responses to the challenges of the Anthropocene and enhance intergenerational health equity.

Ecological economics. The dominant economic paradigm of infinite growth through exploitation of natural resources is unsustainable. Ecological economics involves governing economic activity in a way that promotes human wellbeing, sustainability and justice.[42] An ecological economics approach requires disinvestment from fossil fuels and other industries that involve socially unjust, ecologically unsustainable and human health-harming practices. Ecological economics in health promotion offers a pathway to address planetary health and the social determinants of health through equitable distribution of resources.[42]

Health co-benefits. Many measures that reduce greenhouse gas emissions have synergistic human health benefits. This relationship is referred to as co-benefits.[43] The economic value of co-benefits from climate mitigation efforts is large, often equalling or exceeding mitigation costs.[44] Strategies that reduce emissions and simultaneously promote health include clean air initiatives, active transport, energy efficient housing and plant-based diets.[43,45]

Climate-resilient development. Climate-resilient development provides a framework by which policies and practice can link with overarching goals for a future that protects both humans and the planet. Climate change mitigation and adaptation are both key elements of this approach, and inform integrated solutions and decision making. There is growing international focus on climate-resilient development — both the processes and the pathways. It is vital that the health promotion community is linked with these discussions, and that it supports neighbours in the Pacific region to achieve nationally determined climate-resilient development.[46] An example of climate-resilient development in an Australian context is the Hepburn Community Wind Park Co-operative, which manages a community-owned wind farm near Daylesford, north-west of Melbourne. The cooperative distributes financial returns from the wind farm to members, and funds local projects through their community fund.[47] This community-led approach has multiple co-benefits for health, the economy and the environment.[48] Notably, its success is founded on health promotion principles, and practices of community engagement and empowerment.

Direction 3: Prioritise workforce development, leadership and evaluation efforts in health promotion

Workforce development. In-service and pre-service training on planetary health needs to be a central pillar in building the capacity of the health promotion sector. Without this essential investment in the workforce, health promoters will be unable to lead and engage effectively in advocacy and policy efforts. Health promoters working at different scales require: skills in climate change communication; the ability to engage partners in a planetary health approach; and technical skills in the delivery of health co-benefit interventions.[49,50] The IUHPE's adoption of a planetary health framework has signalled the need for reorientation of health promotion training to include ecological determinants.

Leadership. Many health issues associated with the Anthropocene arise outside the health sector. Health promotion's strong track record in stakeholder engagement and leading change will be beneficial. Health promotion has an important role in demanding fossil fuel disinvestment (Direction 1), advocating for health-promoting public policy (Case study 1) and championing frameworks that reference planetary health and ecological determinants. To be credible in influencing and leading change, peak health promotion organisations will need to articulate their own vision and strategies for promoting planetary health and achieving net zero emissions.

Data and evaluation. Proponents of ecological determinants in health promotion and planetary health have identified the need for data and evaluation tools which reflect environmental and health outcomes.[11,51] In the Anthropocene, it would be remiss of health promotion programs targeting food and nutrition, for example, to only measure human health outcomes. For instance, planetary health measures for environmental outcomes relating to food and nutrition would incorporate greenhouse gas emission indicators such as food miles, animal-based versus plant-based diets, and food waste.[11] Co-benefit data and evaluation tools are required to help health promoters avoid unintended environmental consequences from the delivery of health promotion interventions.

Direction 4: Recognise nature's role in promoting health and delivering co-benefits

The social, physical, mental and spiritual health benefits of contact with nature are well documented.[52,53] Likewise, there is evidence of benefits from taking action on climate change and volunteering to promote pro-environmental attitudes.[54,55] However, so far nature has been underutilised as a setting for health promotion and nature-based interventions. Nature could be given a much greater role in community-based health promotion and in realising planetary health goals. Case study 2 demonstrates how community actions and settings-based approaches that have co-benefits enable local action on ecological determinants.

Case study 2. The Kooweerup Regional Health Service's model of planetary health action is well documented[56,57] and has attracted multiple awards for climate resilience, leadership and emissions reductions.[58] Its men's shed, community garden and ecohouse provide settings for recovery from illness and injury, knowledge exchange, personal leadership, social connection, and mental health promotion through ecological, sustainable

and nature-based activities.[59] The community garden provides a biodiverse habitat for local fauna, such as the southern brown bandicoot, and human health benefits such as protection from heat, wind and flood.[56,59] This example demonstrates that health promotion leadership and strategies are highly compatible with action on climate change at local, community and settings-based levels.

Conclusion

To secure human health and wellbeing in 2030 and beyond, health promoters need to think, plan and act with renewed imagination and courage. Immense as the task may seem, the vision for healthy, just and sustainable communities can be forged. This will require renewed commitments to addressing the ecological determinants of health and working together to tackle multiple, intersecting determinants of planetary health. A 21st century health promoter's line of sight needs to be on protecting all forms of life, not just humans, to achieve human health goals. The next decade requires us to engage directly in advocating for climate action and disinvestment from fossil fuels while rapidly preparing the health promotion sector for planetary health thinking and action. This is the critical decade for action — lives depend on it.

Acknowledgements: This chapter is part of a supplement funded by the Victorian Health Promotion Foundation (VicHealth). VicHealth is a pioneer in health promotion. It was established by the Victorian Parliament as part of the *Tobacco Act 1987* and has a primary focus on promoting good health for all and preventing chronic disease.

Competing interests: No relevant disclosures.

Provenance: Commissioned; externally peer reviewed. ■

How to cite this chapter: Patrick R, Armstrong F, Capon A, et al. Health promotion in the Anthropocene: the ecological determinants of health. *Med J Aust* 2020; 214 (8 Suppl): S22–S26.

1 International Union for Health Promotion and Education. Waiora — Indigenous peoples' statement for planetary health and sustainable development. Rotorua: IUHPE, 2019. https://www.iuhpe2019.com/PicsHotel/iuhpe/Brochure/Indigenous%20Statement%20for%20Plenary%20Revised.pdf (viewed July 2020).

2 Spady DW, Soskolne CL, editors. Global change and public health: addressing the ecological determinants of health. Ottawa: Canadian Public Health Association, 2015. https://www.cpha.ca/sites/default/files/assets/policy/edh-discussion_e.pdf (viewed July 2020).

3 Townsend M, Ebden M. Natural environments. In: Keleher H, MacDougall C, editors. Understanding health: a social determinants approach. 2nd ed. Melbourne: Oxford University Press, 2010: 41–58.

4 Corvalen C, Hales S, McMichael A. Ecosystems and human-wellbeing: health synthesis: a report of the Millennium Ecosystem Assessment. Geneva: World Health Organization, 2005. https://apps.who.int/iris/bitstream/handle/10665/43354/9241563095.pdf?sequence=1 (viewed Mar 2021).

5 World Health Organization. Climate change and health: ecosystems goods and services for human health. Geneva: WHO, 2021. https://www.who.int/globalchange/ecosystems/en (viewed July 2020).

6 Brown VA, Grootjans J, Ritchie J, et al. Sustainability and health: supporting global ecological integrity in public health. Sydney: Allen and Unwin, 2005.

7 Chu CM, Simpson R, editors. Ecological public health: from vision to practice. Brisbane: Watson Ferguson and Company, 1994.

8 World Health Organization. Ottawa charter for health promotion. Charter adopted at International Conference on Health Promotion; Ottawa (Canada), 17–21 Nov 1986. https://www.who.int/publications/i/item/ottawa-charter-for-health-promotion (viewed Mar 2021).

9 Patrick R, Capetola T, Townsend M, Nuttman S. Health promotion and climate change: exploring the core competencies required for action. *Health Promot Int* 2012; 27: 475–485.

10 Butler CD, Friel S. Time to regenerate: ecosystems and health promotion. *PLoS Med* 2006; 3: e394.

11 Patrick R, Kingsley J. Health promotion and sustainability programmes in Australia: barriers and enablers to evaluation. *Glob Health Promot* 2019; 26: 82–92.

12 Parra PY, Hare B, Hutfilter UF, Roming N. Evaluating the significance of Australia's global fossil fuel carbon footprint. Climate Analytics, 2019. https://climateanalytics.org/media/australia_carbon_footprint_report_july2019.pdf (viewed Feb 2021).

13 Moss J. When it comes to climate change, Australia's mining giants are an accessory to the crime. *The Conversation* 2019; 26 Sept. https://theconversation.com/when-it-comes-to-climate-change-australias-mining-giants-are-an-accessory-to-the-crime-124077 (viewed Feb 2021).

14 Climate Action Tracker. Australia: country summary. https://climateactiontracker.org/countries/australia (viewed Jan 2021).

15 Montt G, Maître N, Amo-Agyei S. The transition in play: worldwide employment trends in the electricity sector (Research Department Working Paper No. 28). Geneva: International Labour Organization, 2018. http://www.oit.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_625865.pdf (viewed Feb 2021).

16 Task Force on Climate-Related Financial Disclosures. Recommendations of the Taskforce on Climate-Related Financial Disclosures: final report. TCFD, 2017. https://assets.bbhub.io/company/sites/60/2020/10/FINAL-2017-TCFD-Report-11052018.pdf (viewed Feb 2021).

17 World Health Organization. Manifesto for a healthy recovery from COVID-19: prescriptions for a healthy and green recovery from COVID-19. Geneva: WHO, 2020. https://www.who.int/news-room/feature-stories/detail/who-manifesto-for-a-healthy-recovery-from-covid-19 (viewed Sept 2020).

18 Beyer RM, Manica A, Mora C. Shifts in global bat diversity suggest a possible role of climate change in the emergence of SARS-CoV-1 and SARS-CoV-2. *Sci Total Environ* 2021; 767: 145413.

19 Lo SN, Skarbeck A, Capon A. Recovery from the pandemic: evidence-based public policy to safeguard Australian health [letter]. *Med J Aust* 2020; 213: 284-284.e1. https://www.mja.com.au/journal/2020/213/6/recovery-pandemic-evidence-based-public-policy-safeguard-health

20 Butler C, Denis-Ryan A, Graham P, et al. Decarbonisation futures: solutions, actions and benchmarks for a net zero emissions Australia. Technical Report. Melbourne: ClimateWorks, 2020. https://www.climateworksaustralia.org/resource/decarbonisation-futures-solutions-actions-and-benchmarks-for-a-net-zero-emissions-australia (viewed Mar 2021).

21 Patrick R, Armstrong F, Hancock T, et al. Climate change and health promotion in Australia: navigating political, policy, advocacy and research challenges. *Health Promot J Austr* 2019; 30: 295–298.

22 Hancock T, Capon AG, Dietrich U, Patrick RA. Governance for health in the Anthropocene. *Int J Health Gov* 2016; 21: 245–262.

23 Stockholm Resilience Centre. Planetary boundaries. https://stockholmresilience.org/research/planetary-boundaries.html (viewed July 2020).

24 Steffen W, Richardson K, Rockstrom K, et al. Planetary boundaries: guiding human development on a changing planet. *Science* 2015; 347: 6223.

25 Falkenberg LJ, Bellerby RG, Connell SD, et al. Ocean acidification and human health. *Int J Environ Res Public Health* 2020; 17: 4563.

26 Armstrong F, Capon T, McFarlane R. Coronavirus is a wake-up call: our war with the environment is leading to pandemics. *The Conversation* 2020; 31 Mar. https://theconversation.com/coronavirus-is-a-wake-up-call-our-war-with-the-environment-is-leading-to-pandemics-135023 (viewed July 2020).

27 Climate and Health Alliance. Climate change is a health issue (Briefing Paper No. 1). Melbourne: CAHA, 2018. https://d3n8a8pro7vhmx.cloudfront.net/caha/pages/33/attachments/original/1539054808/CAHA_Briefing_Paper_1_Climate_change_is_a_health_issue_2018.pdf?1539054808 (viewed June 2020).

28 Hughes L, Steffen W, Mullins G, et al. Summer of crisis. Sydney: Climate Council of Australia, 2020. https://www.climatecouncil.org.au/wp-content/uploads/2020/03/Crisis-Summer-Report-200311.pdf (viewed July 2020).

29 Richards L, Brew N, Smith L. 2019–20 Australian bushfires — frequently asked questions: a quick guide. Canberra: Parliament of Australia, 2020. https://parlinfo.aph.gov.au/parlInfo/download/library/prspub/7234762/upload_binary/7234762.pdf (viewed July 2020).

30 Arriagada NB, Palmer AJ, Bowman D, et al. Unprecedented smoke-related health burden associated with the 2019–20 bushfires in eastern Australia [letter]. *Med J Aust* 2020; 213: 282–283. https://www.mja.com.au/journal/2020/213/6/unprecedented-smoke-related-health-burden-associated-2019-20-bushfires-eastern

31 Johnston FH, Borchers-Arriagada N, Morgan GG, et al. Unprecedented health costs of smoke-related PM2.5 from the 2019–20 Australian megafires. *Nat Sustain* 2021; 4: 42–47.

32 Bryant RA, Waters E, Gibbs L, et al. Psychological outcomes following the Victorian Black Saturday bushfires. *Aust N Z J Psychiatry* 2014; 48: 634–643.

33 Department of Health and Human Services. Advice for public health and wellbeing planning in Victoria: planning cycle 2017–2021. Melbourne: DHHS, 2017. https://www2.health.vic.gov.au/about/publications/policiesandguidelines/public-health-wellbeing-planning-advice-2017-2021 (viewed July 2020).

34 Silva N. Indigenous communities disproportionately affected by catastrophic bushfires, Royal Commission hears. *NITV News* 2020; 19 June. https://www.sbs.com.au/nitv/article/2020/06/19/indigenous-communities-disproportionately-affected-catastrophic-bushfires-royal (viewed July 2020).

35 World Health Organization Regional Office for the Western Pacific. Human health and climate change in Pacific island countries. Geneva: WHO, 2015. https://www.who.int/publications/i/item/human-health-and-climate-change-in-pacific-island-countries (viewed Feb 2021).

36 Watts N, Adger W, Agnolucci P, et al. Health and climate change: policy responses to protect public health. *Lancet* 2015; 386: 1861–1914.

37 Malik A, Lenzin M, McAlister S, McGain F. The carbon footprint of Australian health care. *Lancet Planet Health* 2018; 2: e27–e35.

38 Horsburgh N, Armstrong F, Mulvenna V. Framework for a national strategy on climate, health and well-being for Australia. Melbourne: Climate and Health Alliance, 2017. https://d3n8a8pro7vhmx.cloudfront.net/caha/pages/40/attachments/original/1498008324/CAHA_Framework_for_a_National_Strategy_on_Climate_Health_and_Well-being_v05_SCREEN_%28Full_Report%29.pdf?1498008324 (viewed July 2020).

39 Buse CG, Oestreicher JS, Ellis NR, et al. Public health guide to field developments linking ecosystems, environments and health in the Anthropocene. *J Epidemiol Community Health* 2018; 72: 420–425.

40 Whitmee S, Haines A, Beyrer C, et al. Safeguarding human health in the Anthropocene epoch: report of the Rockefeller Foundation-Lancet Commission on planetary health. *Lancet* 2015; 386: 1973–2028.

41 International Union for Health Promotion and Education. Rotorua Statement. Waiora: promoting planetary health and sustainable development for all. Rotorua: IUHPE, 2019. https://www.iuhpe.org/images/CONFERENCES/world/2019/Rotorua_statement_final.pdf (viewed Feb 2021).

42 Hancock T. Ecological economics and public health: an interview with Dr Trevor Hancock. Montréal: National Collaborating Centre for Healthy Public Policy, 2019. http://www.ncchpp.ca/docs/2020-policy-and-climate-change-ethics-ecological-economics-and-public-health.pdf (viewed Mar 2021).

43 Smith KR, Woodward A, Campbell-Lendrum D, et al. Human health: impacts, adaptation, and co-benefits. In: Field CB, Barros VR, Dokken DJ, editors. Climate change 2014: impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of Working Group II to the fifth assessment report of the Intergovernmental Panel on Climate Change. Cambridge and New York: Cambridge University Press, 2014: 709–754. https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap11_FINAL.pdf (viewed Apr 2015).

44 Karlsson M, Alfredsson E, Westling N. Climate policy co-benefits: a review. *Climate Policy* 2020; 20: 292–316.

45 Willett W, Rockström J, Loken B, et al. Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *Lancet* 2019; 393: 447–492.

46 Denton F, Wilbanks TJ, Abeysinghe AC, et al., et al. Climate-resilient pathways: adaptation, mitigation, and sustainable development. In: Field CB, Barros VR, Dokken DJ eds. Climate change 2014: impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of Working Group II to the fifth assessment report of the Intergovernmental Panel on Climate Change. Cambridge and New York: Cambridge University Press, 2014: 1101–1131. https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap20_FINAL.pdf (viewed Mar 2021).

47 Steffen W, Hughes L, Sahajwalla V, Hueston G. The critical decade: Victorian climate impacts and opportunities. Melbourne: Department of Climate Change and Energy Efficiency, 2014. https://www.climatecouncil.org.au/uploads/b51e50d06ff672af4bdd76383b05d381.pdf (viewed Mar 2021).

48 Hepburn Wind. About the wind farm. https://www.hepburnwind.com.au/wind-farm (viewed Mar 2021).

49 Patrick R, Kingsley J, Capetola T. Health-related education for sustainability: public health workforce needs and the role of higher education. *Aust J Environ Educ* 2016; 32: 192–205.

50 Patrick R, Smith JA. Core health promotion competencies in Australia: are they compatible with climate change action? *Health Promot J Austr* 2011; 22: 28–33.

51 Moysés SJ, Soares RC. Planetary health in the Anthropocene. *Health Promot Int* 2019; 34 Suppl 1: i28–i36.

52 Townsend M, Henderson-Wilson C, Warner E, Weiss L. Healthy parks, healthy people: the state of the evidence 2015. Melbourne: Deakin University and Parks Victoria, 2015. https://www.iucn.org/sites/dev/files/content/documents/hphpstate-evidence2015.pdf (viewed Mar 2021).

53 Capaldi CA, Dopko RL, Zelenski JM. The relationship between nature connectedness and happiness: a meta-analysis. *Front Psychol* 2014; 5: 976.

54 Jennings N, Fecht D, De Matteis S. Mapping the co-benefits of climate change action to issues of public concern in the UK: a narrative review. *Lancet Planet Health* 2020; 4: e424–e433.

55 Patrick R, Henderson-Wilson C, Ebden M. Exploring the co-benefits of environmental volunteering for human and planetary health promotion. *Health Promot J Austr* 2021. https://doi.org/10.1002/hpja.460 [online ahead of print].

56 Ayres L. The Koo Wee Rup (KWR) Men's Shed: human health and environmental sustainability evaluation [thesis]. Melbourne: Deakin University, 2015. https://www.kooweerupphospital.net.au/sites/default/files/KWR%20Men%27s%20Shed%20-%20Deakin%20Research%20Summary%202015.pdf (viewed June 2020).

57 Patrick R, Capetola T. It's here! Are we ready? Five case studies of health promotion practices that address climate change from within Victorian health care settings. *Health Promot J Austr* 2011; 22: s6–s12.

58 Global Green and Healthy Hospitals. 2020 challenge climate champion case study – leadership. Kooweerup Regional Health Service (KRHS). GGHH, 2016. https://www.greenhospitals.net/wp-content/uploads/2017/05/2020-Challenge-Climate-Champion-Case-Study-Leadership-Australia.pdf (viewed June 2020).

59 Thoms A, Fitcher K. Environmental sustainability report 2017. Koo Wee Rup: Kooweerup Regional Health Service, 2017. https://www.kooweerupphospital.net.au/sites/default/files/Environmental%20Sustainability%20Report%202017.pdf (viewed June 2020). ■

Chapter 5
Disrupting the commercial determinants of health

Alexandra Jones[1], Jennifer Lacy-Nichols[2], Phil Baker[3], Anne Marie T Thow[4], Jane E Martin[5], Mike Daube[6], Kathryn Backholer[7], Belinda Townsend[8]

Summary

- Our vision for 2030 is an Australian economy that promotes optimal human and planetary health for current and future generations. To achieve this, current patterns of corporate practice and consumption of harmful commodities and services need to change.
- In this chapter, we suggest ways forward for Australia, focusing on pragmatic actions that can be taken now to redress the power imbalances between corporations and Australian governments and citizens.
- We begin by exploring how the terms of health policy making must change to protect it from conflicted commercial interests. We also examine how marketing unhealthy products and services can be more effectively regulated, and how healthier business practices can be incentivised.
- Finally, we make recommendations on how various public health stakeholders can hold corporations to account, to ensure that people come before profits in a healthy and prosperous future Australia.

In 2019, the Lancet Commission on Obesity called for action to reset the priorities of our political, economic and social systems going forward, including new forms of market activity and governance to improve human and planetary health.[1] The inequities highlighted by the continuing coronavirus disease 2019 (COVID-19) crisis further stress the urgency of this call. Among appeals to build back better, there are opportunities for public health to take immediate action to redress longstanding power imbalances between health and economic interests, and in doing so contribute to a long term vision for Australia's sustainable economic prosperity.

Our vision for 2030 is an Australian economy that promotes optimal human and planetary health for current and future generations. Every year in Australia, nine out of ten deaths are caused by non-communicable diseases (NCDs) which are primarily driven by the health risks of tobacco use, harmful alcohol use, unhealthy diets and physical inactivity.[2,3] These risks are exacerbated by our current economic environment — an environment that increases exposure to harmful commodities and services, and enables corporate producers to shape public health policy in their favour.[4]

A growing body of literature seeks to identify, analyse and question how powerful private sector actors influence health.[5-8] This work recognises the positive contributions that many corporations make to society — such as generating employment, providing essential products and services, and investing in innovation — but also recognises that, left unchecked, corporate behaviour too often puts profit before human health and the environment.[6,9] For the purposes of this chapter, we use the term "commercial determinants of health" to refer to what has been defined as "strategies and approaches used by the private sector to promote products and choices that are detrimental to health".[5] We use this term to cover multiple areas: first, the harmful commodities and services that contribute to ill health (eg, tobacco, alcohol, sugar-sweetened beverages, ultraprocessed foods and gambling); second, business, promotional and political practices that are harmful to health (eg, labour practices, environmental exposures, pricing, marketing, and use of social media and political lobbying); and third, the global drivers of ill health such as globalisation and trade liberalisation that perpetuate corporate use of harmful practices.[10]

Evidence of the commercial determinants of health can be seen in the continuing burden of NCDs in Australia. Australia is seen as a global leader in tobacco control and now has some of the lowest smoking rates in the world following decades of sustained, innovative and well coordinated advocacy by health coalitions that have presented consistent messages.[11] However, this success has not thus far been matched in other areas of NCD policy. Ultraprocessed foods contribute 42% of our population's energy intake,[12] yet we lack a comprehensive food and nutrition policy to support healthier diets. Gambling harm is on the rise, facilitated by the proliferation of online gambling, yet policy to counter its impact is either weak or non-existent.[13] Although heavy episodic drinking is on the decline, we are among the world's highest per capita alcohol consumers.[14] Australia also continues to negotiate and sign trade and investment agreements that serve as structural drivers of NCDs.[15] Examples of commercial determinants of health in Australia are shown in Box 1.

The ubiquity of these practices highlights the urgent need to develop better mechanisms to identify, describe and, where necessary, disrupt the influence of powerful corporations on health.[26] In this chapter, we make suggestions for an Australian response to commercial determinants of health, focusing on pragmatic actions that can be taken now to redress the power imbalances between corporations and Australian governments and citizens.

Changing the terms of corporate engagement in health policy making

While Australia has been a world leader in tobacco control, its approach to industry engagement in the areas of food, gambling and extractive industries has been very different. Globally, tobacco is the strongest domain for guidelines on conflicts of interest. Article 5.3 of the WHO Framework Convention on Tobacco Control and its guidelines recognise the fundamental and irreconcilable conflict between the tobacco industry and public health policy interests.[27,28] The 181 parties to the framework, including Australia, must protect policies from the commercial and vested interests of the tobacco industry; this means that all sectors and levels of government are formally required to exclude the tobacco industry (and researchers who work with them) from policy development processes, and to avoid using softer regulatory measures (eg, partnerships and non-binding agreements) in tobacco control policies.

[1] George Institute for Global Health, UNSW, Sydney, NSW. [2] University of Melbourne, Melbourne, VIC. [3] Institute for Physical Activity and Nutrition, Deakin University, Melbourne, VIC. [4] Menzies Centre for Health Policy, University of Sydney, Sydney, NSW. [5] Cancer Council Victoria, Melbourne, VIC. [6] Curtin University, Perth, WA. [7] Deakin University, Geelong, VIC. [8] Menzies Centre for Health Governance, Australian National University, Canberra, ACT. ajones@georgeinstitute.org.au • doi: 10.5694/mja2.51020

1 Examples of market, political and cross-cutting commercial determinants of health in Australia

Determinant	Example
Market	
Marketing and advertising harmful commodities	Alcohol and junk food marketing leveraging the coronavirus disease 2019 pandemic for commercial gain while exacerbating non-communicable disease risks[16]
Sponsoring sporting associations and clubs	KFC sponsorship of the family-focused Twenty20 Cricket ($8 million spend in 2020)[17]
Targeting youth and other vulnerable groups	Dan Murphy's building a liquor barn between three dry Aboriginal communities in the Northern Territory[18]
Political	
Industry lobbying and revolving doors	One-third of those registered on the Australian Government Register of Lobbyists were previously government representatives[19]
Industry framing strategies	Healthy eating is framed as a matter of individual responsibility while government regulation is framed as interference by the "nanny state"[20]
Funding of front organisations	The Sugar Nutrition Resource Centre is funded by Sugar Australia and New Zealand Sugar; it is billed as a scientific information service, but makes submissions that actively oppose public health nutrition policies[21]
Voluntary self-regulation	Exposure of children to advertising for food, alcohol and gambling is industry-controlled under voluntary codes which contain loopholes and lack transparency and accountability[22]
Litigation or threat of litigation	Philip Morris International sued Australia over tobacco plain packaging in national and international courts; while ultimately unsuccessful, the strategy delayed introduction of similar measures in other countries[23]
Cross-cutting	
Policy incoherence	Australia defended its tobacco plain packaging laws against state disputes at the World Trade Organization while simultaneously raising concerns over Thailand's proposed alcohol labelling measures
Poorly managed conflicts of interest	The development of the food scoring algorithm for Australia's voluntary Health Star Rating nutrition label involved government collaboration with representatives of large food companies, despite the World Health Organization's recommendation that this process be independent of commercial interests[24,25]

Beyond tobacco industry exclusion, existing global guidance calls on the World Health Organization, the United Nations and their member states to engage constructively with the private sector in addressing NCDs and the Sustainable Development Goals. In 2016, the WHO endorsed a framework of engagement with non-state actors,[29] which recognises the risk of conflicted interests to health, but also groups the private sector together with other non-state actors such as civil society organisations, philanthropic foundations and academic entities. Some critics have suggested that this framework could also be interpreted as an invitation for increased collaboration with industry without adequate safeguards.[30,31]

In an NCD context, the contrast between continuing high level political commitment to collaborating with the private sector and the limited evidence for the effectiveness of these collaborations is striking.[32] In Australia, multiple evaluations suggest that despite laudable objectives, multistakeholder initiatives such as the Healthy Food Partnership and the Health Star Rating system have achieved little in their voluntary forms.[24,33] While food is not tobacco in that we need it to survive, it is clear that a fundamental and irreconcilable conflict exists between at least some ultraprocessed food and beverage companies' interests and those of public health and the environment. Large swathes of the product portfolios of Australia's largest food companies are salty snacks, confectionery and sugar-sweetened beverages that are not a necessary part of a healthy diet.[34] Yet it is these companies — "big food", "big soda" and their peak associations — and not those representing vegetables, fruits and other minimally processed foods that currently occupy seats at the policy-making table.[35,36] The same is true of direct participation in policy making by the alcohol and gambling industries.

Given that progress continues to be slow, Australia must now consider terms more analogous to Article 5.3's requirements to reform industry engagement in other areas of NCD policy making. This need not rely on the unlikely creation of further international treaties. In the context of diets, guidance is available from the WHO in its tool for safeguarding against possible conflicts of interest in national nutrition programs.[37] Countries including the United Kingdom and Canada have recently implemented updated guidance on government engagement with food industry stakeholders.[38,39] In Canada, this has resulted in food industry exclusion from the scientific process of updating dietary guidelines.

Similar guidance is needed in Australia to reframe engagement with the food, alcohol and gambling industries. Appropriate terms may not mean automatic exclusion, but should shift away from an unjustified presumption of industry being part of the solution in addressing NCDs. Opportunity for appropriate stakeholders to be consulted during policy making should be distinguished from current examples of industry as a collaborator. Collaboration entails norms of reciprocity and input, while consultation generally confers only a right to be heard. The COVID-19 pandemic has acted as a timely reminder that governments have the mandate to promote and protect public health, and that governments thereby have ultimate responsibility for initiating, developing and evaluating public health policies.[10,40]

Where industry engagement continues, governance must be strengthened to go beyond merely identifying conflicts of interest — substantive procedures for meaningful management and prevention of undue influence are needed. Precedent is available in National Health and Medical Research Council (NHMRC) guidelines, which suggest that management of conflicts of interest on multistakeholder committees should include conflicted members recusing themselves from specific decisions or being excluded from writing relevant recommendations.[41] These processes must be applied to the forthcoming update of the Australian Dietary Guidelines. They should also be adopted by the multistakeholder committees working on alcohol and gambling policy.

The NHMRC's work also recognises the difference between financial and other interests (eg, having published relevant literature or being a recognised opinion leader). While all parties involved are likely to have an interest in the subject of policy making, non-financial interests are easier to manage (eg, by consensus decision making), whereas genuine conflicts of interest are primarily financial in nature.[41] It is the profit motives of harmful industries that are most problematic in evidence-based policy making, and Australia needs better governance

and regulatory mechanisms to address these. In addition to the implementation of formal guidelines, strong investigative journalism and civil society monitoring can promote improved transparency and practice in this area. Potential mechanisms for Australian governments to manage corporate influence on public health policy are summarised in Box 2.

Regulating the marketing of unhealthy commodities and services

Corporations shape demand and social desirability for unhealthy commodities through pervasive and ubiquitous marketing practices. Unequivocal evidence shows that exposure to marketing of unhealthy products influences attitudes, perceptions, expectations and behaviour across the life course.[43-45] The power and influence of corporate marketing has never been so great. We live in a rapidly changing, digital world where marketing and advertising of unhealthy brands adhere to no borders, and where content is more personalised and targeted than ever before. This power and influence is likely to increase, supported by big data and artificial intelligence to influence behaviour in ways once unimaginable (Chapter 6). The COVID-19 pandemic may have also amplified marketing power, with brands strategically aligning campaigns to the COVID-19 context with the intent of legitimising consumption, increasing brand loyalty and sales, and discouraging regulation through communication of corporate social responsibility activities.[16]

Restricting unhealthy marketing is a key recommendation of authoritative health bodies.[46,47] Like its strength in governing industry engagement, the WHO Framework Convention on Tobacco Control has driven and supported substantial progress in restricting tobacco marketing in Australia and overseas. Tobacco marketing has been restricted in 168 countries; in Australia this includes a total ban on marketing, promotion and sponsorship, and tobacco plain packaging law.[48] The same progress has not been made in regulating the marketing of alcohol, unhealthy foods and gambling.

Industry self-regulation of marketing has been ineffective and is likely to remain so.[22,49] Marketing literacy is sometimes proffered as a counter-solution to unhealthy marketing, but there is no evidence to suggest that this is effective. And, even if it were, it would be likely to disproportionately benefit more affluent and highly educated people. A comprehensive, mandatory regulatory framework that covers all forms of marketing and the media through which it is propagated is required to protect Australians from the economic exploitation of unhealthy marketing. International human rights instruments, including the UN Convention on the Rights of the Child[50] (which Australia ratified in 1990) and rights to uphold digital privacy and data protection could be used to strengthen action by highlighting areas where rights are violated. The mechanisms by which online marketing is produced and disseminated are extremely complex, involving a large network of stakeholders and little transparency.[51] Unambiguous regulatory design is therefore required, which may be best achieved through stringent, legislated curbs on all marketing for unhealthy products online. All eyes are currently on the UK, where the government has recently proposed a total ban on online unhealthy food advertising, which is currently under public consultation.[52] For any such regulation to be effective, regular monitoring and enforced sanctions for non-compliance are needed.

2 Potential mechanisms for Australian governments to manage corporate influence on public health policy, based on an international review of existing initiatives[42]

- Public health plans or strategies that explicitly protect public health policies from commercially conflicted interests
- Policies on conflicts of interest that are specific, such as rules on: risk analysis for accepting funding; how individual and institutional conflicts of interest will be reported, reviewed, monitored and managed (including restricted if needed); and sanctions for non-compliance
- Mandatory waiting periods after ceasing employment from a company before individuals can work with government and vice versa
- Potential exclusion of individuals who have a conflict of interest from participating in government committees or advisory groups
- Public disclosure of ministerial and government meetings with industry, including the purposes of those meetings
- Policies that reject government partnerships with specific harmful industries
- Strong protection of whistleblowers
- Public disclosure of lobbyists, including funding sources and targets
- Policies that prohibit governments from endorsing or partnering in industry-sponsored activities, including corporate social responsibility activities

Creating incentives for healthier business

Beyond the role of government in imposing higher standards on corporations to protect health, there is also a need to explore constructive, viable and positive business responses to support a healthier future for Australia.[6] The private sector is not a homogenous entity; arguably, no actor is wholly health harming or health promoting. Nuanced understanding of the private sector is needed not only to inform risk management, but also to explore opportunities for scaling up health-promoting business practices.

Corporate health impact assessments that consider the full spectrum of health impacts of a given corporation[53] (Chapter 7) can inform which entities public health should work with, and why.[6] Programs such as the B Corp initiative, which creates legal obligations for participating business to consider impacts on workers and the environment, could be broadened to incorporate greater consideration of health.[54] Benchmarking initiatives, used effectively in the environmental sustainability context, are starting to be used in areas like nutrition to attract or deter private investment in corporate actors.[55] In Australia, an innovative push to encourage large institutional investors to divest from big tobacco provides inspiration for harnessing the power of the finance industry to create incentives for healthier corporate behaviour elsewhere.[56] Strategic litigation also offers potential for consumers to hold corporations to account for health impacts, and could shift subsequent business practice.

In building back better, there is opportunity to learn from other sectors that have taken steps to safeguard or promote health. Policy examples from the trade and investment industry are shown in Box 3. Another example is from the energy sector, where structural incentives (eg, subsidies) have created a shift away from the use of fossil fuels and towards use of renewable technologies. In parallel, it is important to provide support for those who rely on unhealthy or unsustainable products for their livelihoods, as Australia previously did to transition tobacco farmers to alternative crops.[59] These "just transitions" are crucial not only to ensure community support, but also to implicitly recognise the public health importance of secure employment and a role for healthy, sustainable and equitable businesses.

Holding corporations to account

It is time for all stakeholders to hold corporations to account. The COVID-19 pandemic has provided a clarion call for the importance of health for both our individual wellbeing and the

3 Safeguarding health in trade and investment agreements

- Trade and investment agreements can serve as structural drivers for non-communicable diseases.[15] While such agreements can also contribute to a prosperous and healthy society, to do so they must reserve space for governments to implement domestic policies that protect health and well-being. They must also promote healthy investments such as healthy food and renewable energy technology.
- One important area for reform is preventing the use of investor–state dispute settlement (ISDS) mechanisms. These mechanisms allow corporations to sue governments over their health and environmental policies and programs, as done by tobacco giant Philip Morris International in contesting Australia's 2011 tobacco plain packaging law. Recent innovations in international trade and investment agreements that raise the bar for safeguarding public health suggest potential ways forward: for example, the Peru–Australia Free Trade Agreement (2018) states: "No claim may be brought … in relation to a measure that is designed and implemented to protect or promote public health" (https://www.dfat.gov.au/sites/default/files/chapter-8-investment.pdf). A stronger option is not to agree to ISDSs in trade agreements. Previous Australian policy between 2011 and 2017 was not to agree to ISDSs. Some governments such as India and South Africa are now removing ISDSs from their investment treaties.
- Inclusion of strong safeguards for public health in trade and investment agreements will require political will and leadership to accord greater priority to health. Recent analysis shows why tobacco control has advanced further on Australia's trade agenda than other health issues.[57] Bipartisan commitment behind Australia's plain packaging success demonstrates that this is possible, particularly when supported by a rapidly evolving base of public health evidence and an effective coalition of public health advocates.[15,58] It will also require improved governance of trade policy, including greater transparency in negotiations and meaningful consultations with public health experts. The use of health impact assessments before trade agreements are signed and for their duration will also guide greater understanding of health goals.

functioning of our societies. In the quest to build back better, there are immediate steps that governments and public health stakeholders can take to set us on a path to a more just and sustainable economy, particularly by disrupting the complex conditions that constitute the commercial determinants of health.

As health researchers and advocates, we must increase our sophistication in systematically identifying and calling out corporate influences on health, and the mechanisms that reinforce these across a variety of industries. In the development of public health policy, this includes a role for public health stakeholders in holding governments to account for introducing meaningful measures to protect policy making from commercial conflicts of interest, such as by making public health participation on multi-stakeholder policy committees contingent on such measures being in place.

Also, there is an important role for public health in generating policy-relevant evidence to support governments to replace soft voluntary measures with stronger, mandatory standards for how corporations make, market and sell unhealthy products and services. This will need to be combined with strategic advocacy to build public support and activate concrete political action. A strong and independent media will be critical to countering pervasive opposition to industry regulation across various components of the media (including News Corp outlets owned by media mogul Rupert Murdoch), which continue to publish messages that undermine the scope and urgency of political action on health and climate regulatory issues in Australia.

Finally, there is a need to train and support a multidisciplinary public health workforce with expertise in areas like law, economics, corporate finance, political science and community organising to strengthen our capacity to hold powerful corporations to account for their role in promoting NCDs. This must be accompanied by increased protections for whistleblowers and advocates, to mitigate risks and protect public health champions from being targets of abuse. While the challenge of shifting current patterns of corporate practice and consumption is formidable, tackling it will be essential in building back an Australian economy that promotes optimal human and planetary health for the future.

Acknowledgements: This chapter is part of a supplement funded by the Victorian Health Promotion Foundation (VicHealth). VicHealth is a pioneer in health promotion. It was established by the Victorian Parliament as part of the *Tobacco Act 1987* and has a primary focus on promoting good health for all and preventing chronic disease. We thank Lewis Keane for his editorial support in preparing this chapter.

Competing interests: No relevant disclosures.

Provenance: Commissioned; externally peer reviewed. ■

How to cite this chapter: Jones A, Lacy-Nichols J, Baker P, et al. Disrupting the commercial determinants of health. *Med J Aust* 2020; 214 (8 Suppl): S27–S31.

1 Swinburn BA, Kraak VI, Allender S, et al. The global syndemic of obesity, undernutrition, and climate change: the Lancet Commission report. *Lancet* 2019; 393: 791–846.

2 World Health Organization. Non-communicable disease country profiles 2018. Geneva: WHO, 2018. www.who.int/nmh/publications/ncd-profiles-2018/en (viewed Feb 2021).

3 World Health Organization. Global action plan for the prevention and control of non-communicable diseases 2013–2020. Geneva: WHO, 2013. https://www.who.int/publications/i/item/9789241506236 (viewed Feb 2021).

4 Moodie R, Stuckler D, Monteiro C, et al. Profits and pandemics: prevention of harmful effects of tobacco, alcohol, and ultra-processed food and drink industries. *Lancet* 2013; 381: 670–679.

5 Kickbusch I, Allen L, Franz C. The commercial determinants of health. *Lancet Global Health* 2016; 4: e895–e896.

6 Rochford C, Tenneti N, Moodie R. Reframing the impact of business on health: the interface of corporate, commercial, political and social determinants of health. *BMJ Global Health* 2019; 4: e001510.

7 McKee M, Stuckler D. Revisiting the corporate and commercial determinants of health. *Am J Public Health* 2018; 108: 1167–1170.

8 Buse K, Tanaka S, Hawkes S. Healthy people and healthy profits? Elaborating a conceptual framework for governing the commercial determinants of non-communicable diseases and identifying options for reducing risk exposure. *Global Health* 2017; 13: 34.

9 Millar JS. The corporate determinants of health: how big business affects our health, and the need for government action! *Can J Public Health* 2013; 104: e327–e329.

10 Mialon M. An overview of the commercial determinants of health. *Global Health* 2020; 16: 1–7.

11 Greenhalgh EM, Bayly M, Scollo MM. 1.3 Prevalence of smoking – adults. In: Greenhalgh EM, Scollo MM, Winstanley MH, editors. Tobacco in Australia: facts and issues. Melbourne: Cancer Council Victoria, 2019. https://www.tobaccoinaustralia.org.au/chapter-1-prevalence/1-3-prevalence-of-smoking-adults (viewed Feb 2021).

12 Machado PP, Steele EM, Levy RB, et al. Ultra-processed foods and recommended intake levels of nutrients linked to non-communicable diseases in Australia: evidence from a nationally representative cross-sectional study. *BMJ Open* 2019; 9: e029544.

13 Armstrong A, Carroll M. Gambling activity in Australia. Melbourne: Australian Gambling Research Centre, Australian Institute of Family Studies, 2017. https://aifs.gov.au/agrc/publications/gambling-activity-australia (viewed Feb 2021).

14 Australian Institute of Health and Welfare. Alcohol, tobacco and other drugs in Australia (AIHW Cat. No. PHE 221). Canberra: AIHW, 2020. https://www.aihw.gov.au/reports/alcohol/alcohol-tobacco-other-drugs-australia/contents/introduction (viewed Feb 2021).

15 Townsend B, Schram A. Trade and investment agreements as structural drivers for NCDs: the new public health frontier. *Aust N Z J Public Health* 2020; 44: 92–94.

16 Non-communicable Disease Alliance, Spectrum Consortium. Signalling virtue, promoting harm: unhealthy commodity industries and COVID-19. Geneva: NCD Alliance, 2020. https://ncdalliance.org/resources/signalling-virtue-promoting-harm (viewed Feb 2021).

17 Roy Morgan. KFC hits it out of the park with Big Bash sponsorship [media release]. 8 Feb 2019. http://www.roymorgan.com/findings/7873-big-bash-cricket-sponsorship-february-2019-20190 2080701 (viewed Feb 2021).

18 Foundation for Alcohol Research and Education. Woolworths a law unto its own in fuelling alcohol harm [media release]. 30 Mar 2020. https://fare.org.au/woolworths-a-law-unto-its-own-in-fuelling-alcohol-harm (viewed Feb 2021).

19 Robertson N, Sacks G, Miller P. The revolving door between government and the alcohol, food and gambling industries in Australia. *Public Health Res Pract* 2019; 29: e2931921.

20 Grunseit AC, Rowbotham S, Crane M, et al. Nanny or canny? Community perceptions of government intervention for preventive health. *Crit Public Health* 2019; 29: 274–289.

21 Sugar Nutrition Resource Centre [website]. https://www.sugarnutritionresource.org (viewed Feb 2021).

22 Reeve B. Self-regulation of food advertising to children: an effective tool for improving the food marketing environment? *Monash Univ Law Rev* 2016; 42: 419–457.

23 Crosbie E, Thomson G. Regulatory chills: tobacco industry legal threats and the politics of tobacco standardised packaging in New Zealand. *N Z Med J* 2018; 131: 25.

24 Jones A, Thow AM, Ni Mhurchu C, et al. The performance and potential of the Australasian Health Star Rating system: a four-year review using the RE-AIM framework. *Aust N Z J Public Health* 2019; 43: 355–365.

25 World Health Organization. Guiding principles and framework manual for front-of-pack labelling for promoting healthy diet. Geneva: WHO, 2019. https://www.who.int/nutrition/publications/policies/guidingprinciples-labelling-promoting-healthydiet/en (viewed Feb 2021).

26 de Lacy-Vawdon C, Livingstone C. Defining the commercial determinants of health: a systematic review. *BMC Public Health* 2020; 20: 1022.

27 World Health Organization. WHO Framework Convention on Tobacco Control. Geneva: WHO, 2003. https://www.who.int/fctc/text_download/en (viewed Feb 2021).

28 World Health Organization. Guidelines for implementation of Article 5.3 of the WHO Framework Convention on Tobacco Control. Geneva: WHO, 2008. https://www.who.int/fctc/guidelines/article_5_3.pdf (viewed Feb 2021).

29 World Health Organization. Framework of engagement with non-state actors. Geneva: WHO, 2016. https://apps.who.int/gb/ebwha/pdf_files/wha69/a69_r10-en.pdf (viewed Feb 2021).

30 Khayatzadeh-Mahani A, Ruckert A, Labonté R. Could the WHO's framework on engagement with non-state actors (FENSA) be a threat to tackling childhood obesity? *Glob Public Health* 2018; 13: 1337–1340.

31 Buse K, Hawkes S. Sitting on the FENSA: WHO engagement with industry. *Lancet* 2016; 388: 446–447.

32 UK Health Forum. Public health and the food and drinks industry: the governance and ethics of interaction. Lessons from research, policy and practice. London: UKHF, 2018. https://www.idrc.ca/sites/default/files/sp/Documents%20EN/ukhf-casebook-jan18.pdf (viewed Feb 2021).

33 Jones A, Magnusson R, Swinburn B, et al. Designing a healthy food partnership: lessons from the Australian food and health dialogue. *BMC Public Health* 2016; 16: 651.

34 Neal B, Sacks G, Shahid M, et al. FoodSwitch: state of the food supply. Sydney: George Institute for Global Health, 2019. https://www.georgeinstitute.org/sites/default/files/food_supply_report.pdf (viewed Feb 2021).

35 Australian Government. Health Star Rating System [website]. http://healthstarrating.gov.au/internet/healthstarrating/publishing.nsf/content/home (viewed Feb 2021).

36 Australian Government Department of Health. Healthy Food Partnership [website]. https://www1.health.gov.au/internet/main/publishing.nsf/Content/Healthy-Food-Partnership-Home (viewed Feb 2021).

37 World Health Organization. Safeguarding against possible conflicts of interest in nutrition programmes: approach for the prevention and management of conflicts of interest in the policy development and implementation of nutrition programmes at country level. Geneva: WHO, 2017. https://www.who.int/nutrition/consultation-doi/comments/en (viewed Feb 2021).

38 Public Health England. Principles for engaging with industry stakeholders. London: UK Government, 2019. https://www.gov.uk/government/publications/principles-for-engaging-with-industry-stakeholders/principles-for-engaging-with-industry-stakeholders (viewed Feb 2021).

39 Health Canada. Transparency of stakeholder communications for healthy eating initiatives. Ottawa: Government of Canada, 2016. https://www.canada.ca/en/services/health/campaigns/vision-healthy-canada/healthy-eating/transparency-stakeholder-communications-healthy-eating-initiatives.html (viewed Feb 2021).

40 Gostin LO, Wiley LF. Public health law: power, duty, restraint. 3rd ed. Berkeley: University of California Press, 2016.

41 National Health and Medical Research Council. Guidelines for guidelines: identifying and managing conflicts of interest. Canberra: NHMRC, 2018. https://www.nhmrc.gov.au/guidelinesforguidelines/plan/identifying-and-managing-conflicts-interest (viewed Feb 2021).

42 Mialon M, Vandevijvere S, Carriedo-Lutzenkirchen A, et al. Mechanisms for addressing and managing the influence of corporations on public health policy, research and practice: a scoping review. *BMJ Open* 2020; 10: e034082.

43 Anderson P, De Bruijn A, Angus K, et al. Impact of alcohol advertising and media exposure on adolescent alcohol use: a systematic review of longitudinal studies. *Alcohol Alcoholism* 2009; 44: 229–243.

44 Binde P. Exploring the impact of gambling advertising: an interview study of problem gamblers. *Int J Ment Health Addict* 2009; 7: 541.

45 Sadeghirad B, Duhaney T, Motaghipisheh S, et al. Influence of unhealthy food and beverage marketing on children's dietary intake and preference: a systematic review and meta-analysis of randomized trials. *Obes Rev* 2016; 17: 945–959.

46 World Health Organization. Set of recommendations on the marketing of foods and non-alcoholic beverages to children. Geneva: WHO, 2010. https://www.who.int/dietphysicalactivity/publications/recsmarketing/en (viewed Feb 2021).

47 World Health Organization Regional Office for Europe. Monitoring and restricting digital marketing of unhealthy products to children and adolescents. Copenhagen: WHO Regional Office for Europe, 2019. https://www.euro.who.int/en/health-topics/disease-prevention/nutrition/publications/2019/monitoring-and-restricting-digital-marketing-of-unhealthy-products-to-children-and-adolescents-2019 (viewed Feb 2021).

48 World Health Organization. 2018 global progress report on implementation of the WHO Framework Convention on Tobacco Control. Geneva: WHO, 2018. https://www.who.int/fctc/reporting/summary_analysis/en (viewed Feb 2021).

49 Watson WL, Lau V, Wellard L. Advertising to children initiatives have not reduced unhealthy food advertising on Australian television. *J Public Health* 2017; 39: 787–792.

50 Handsley E, Reeve B. Holding food companies responsible for unhealthy food marketing to children: can international human rights instruments provide a new approach. *UNSW Law J* 2018; 41: 449–489.

51 World Health Organization Regional Office for Europe. Tackling food marketing to children in a digital world: trans-disciplinary perspectives. Children's rights, evidence of impact, methodological challenges, regulatory options and policy implications for the WHO European region. Copenhagen: WHO Regional Office for Europe, 2016. https://www.euro.who.int/__data/assets/pdf_file/0017/322226/Tackling-food-marketing-children-digital-world-trans-disciplinary-perspectives-en.pdf (viewed Feb 2021).

52 UK Department for Digital, Culture, Media and Sport; UK Department of Health and Social Care. Closed consultation: evidence note. London: UK Government, 2020. https://www.gov.uk/government/consultations/total-restriction-of-online-advertising-for-products-high-in-fat-sugar-and-salt-hfss/evidence-note (viewed Feb 2021).

53 Anaf J, Baum FE, Fisher M, et al. Assessing the health impact of transnational corporations: a case study on McDonald's Australia. *Glob Health* 2017; 13: 7.

54 B Lab. B Impact Assessment [website] https://bimpactassessment.net (viewed Feb 2021).

55 Access to Nutrition Foundation. Access to Nutrition Initiative [website]. https://accesstonutrition.org (viewed Feb 2021).

56 King B, Payne C, Stone E. Tobacco-free investment: harnessing the power of the finance industry in comprehensive tobacco control. *QUT Law Rev* 2017; 17: 161.

57 Townsend B, Friel S, Schram A, et al. What generates attention to health in trade policymaking? Lessons from success in tobacco control and access to medicines: a qualitative study of Australia and the (comprehensive and progressive) Trans-Pacific Partnership. *Int J Health Policy Manag* 2020; https://doi.org/10.34172/ijhpm.2020.80 [online ahead of print].

58 van Leeuwen H. Australia prevails in decade long duel with big tobacco. *Australian Financial Review* 2020; 11 June. https://www.afr.com/world/europe/australia-prevails-in-decade-long-duel-with-big-tobacco-20200610-p551cx (viewed Feb 2021).

59 Lencucha R, Moyo T, Labonte R, et al. Shifting from tobacco growing to alternatives in Malawi? A qualitative analysis of policy and perspectives. *Health Policy Plan* 2020; 35: 810–818. ■

Chapter 6
Digital determinants of health: the digital transformation

Kathryn Backholer[1], Jennifer Browne[1], Annemarie Wright[2,3], Robert Grenfell[4], Anna Peeters[1]

In this chapter we discuss the challenges and opportunities that the digital revolution offers public health in the context of the six digital megatrends outlined by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in a 2019 report on digital megatrends.[1] These six interlinked megatrends represent a significant shift in environmental, economic and social conditions likely to play out over the coming decade.[1] The six megatrends are smarter machines, a data-driven future, reinventing of work, the rise of burning platforms, an increased importance on invisible technologies, and ongoing digital dilemmas.

Summary

- We live in an age of rapid and exponential technological change. Extraordinary digital advancements and the fusion of technologies, such as artificial intelligence, robotics, the Internet of Things and quantum computing constitute what is often referred to as the digital revolution or the Fourth Industrial Revolution (Industry 4.0).
- Reflections on the future of public health and health promotion require thorough consideration of the role of digital technologies and the systems they influence. Just how the digital revolution will unfold is unknown, but it is clear that advancements and integrations of technologies will fundamentally influence our health and wellbeing in the future.
- The public health response must be proactive, involving many stakeholders, and thoughtfully considered to ensure equitable and ethical applications and use.

Smarter machines and a data-driven future

Smarter machines, underpinned by artificial intelligence (AI) technologies, are set to transform almost every industry over the next 10 years.[1] AI is a broad term used to imply the use of computing machines to solve problems and perform tasks in an autonomous or semi-autonomous manner. Rapid advancements in AI are being driven by exponential increases in computing power and the ability to acquire vast amounts of data. An estimated 2.5 quintillion (2.5 billion billion) bytes of data are created daily.[2] Our data-driven future includes increased sophistication in the way we acquire, screen, analyse, interpret and use vast and diverse amounts of data.[1] For public health and health policy makers, the promise of big data lies in leveraging its power, interpreting its meaning, and distilling this knowledge into effective and equitable public health interventions and policies. The return on investment has been, and will continue to be, substantial.

With the digitalisation of most aspects of life and business, the combination of big data and smarter machines will no doubt contribute to more precise disease prediction, surveillance and public health interventions in the future. The ability of machines to recognise patterns in large and complex datasets has enabled a new era of disease detection. For example, the application of machine learning to big data from electronic medical records and/or social media platforms can predict and classify mental health conditions, including depression, schizophrenia and suicidal ideation, with a high degree of accuracy.[3] In the area of diabetes management, AI-based software has been developed to detect diabetic retinopathy.[4] The software analyses ophthalmologists' grading data to detect early signs of the disease. While performance of the system in a real-world setting has revealed several challenges to overcome (eg, a relatively high rate of false positives), the system has potential for improving the efficiency of screening for diabetic retinopathy in primary care (currently only performed by a specialist).[4] These powerful precision techniques offer great hope for public health through earlier diagnosis and care, increased objectivity in disease detection, and reduced diagnostic and therapeutic errors. Questions still to be answered include how clinically valid these predictions are (particularly for different population groups), how usefully predictions can inform clinical decision making relative to current practice, and whether there are any unintended consequences.

Recent expansion of these precision techniques to populations to tailor preventive (rather than treatment or management) interventions for specific population groups is also promising. Known as precision public health, the goal is the delivery of the right intervention to the right population at the right time. This approach will be particularly important for addressing health inequities by supporting rapid and widespread development and provision of more granular community-tailored health solutions, rather than assuming what works for one community will work in another, and by directing finite resources more accurately.[5] Achieving precision public health requires appropriate surveillance data for machine predictions, collected at the appropriate level (community, population groups) and implementation of evidence-informed public health interventions that are best matched to the population of interest. Ill health is unevenly distributed across society, with those experiencing social or economic disadvantage at greater risk. However, these groups of the population are also commonly underrepresented in existing datasets, which risks compounding these health inequities.[6] AI systems can be leveraged for population health equity by using diverse and representative data, building and testing algorithms in diverse populations, evaluating intervention impacts across important indicators of risk stratification, and ongoing refinement of the systems if biases are detected.

The power of automated disease detection, surveillance and prediction can be acutely illustrated with the COVID-19 global pandemic. AI-automated disease surveillance, using natural language processing techniques to screen foreign language news reports, airline data and reports on animal and plant disease outbreaks, was reported to detect the presence of an "unusual pneumonia" outbreak in Wuhan, 9 days before the World Health Organization (WHO) issued an official notice on the emergence of a novel coronavirus.[7] AI-enabled technologies were also used to predict the top 20 destination cities from Wuhan to which a "pneumonia of unknown aetiology" might spread, 4 days before official WHO notification.[8] Moreover, since the COVID-19 outbreak in China, AI technologies have

[1]Global Obesity Centre, Institute for Health Transformation, Deakin University, Geelong, VIC. [2]Victorian Health Promotion Foundation, Melbourne, VIC. [3]University of Melbourne, Melbourne, VIC. [4]Commonwealth Scientific and Industrial Research Organisation, Melbourne, VIC. kathryn.backholer@deakin.edu.au • doi: 10.5694/mja2.51020

been used to model real-time forecasting of confirmed cases of COVID-19 across China.[9] Using data collected between 11 January and 16 February 2020, AI technology was able to estimate the trajectory of COVID-19 and the time points at which Chinese provinces and cities would enter a plateau in transmission. When comparing these forecasts with actual observed cases, accuracy ranged from 97.7% to 99.3%.

Looking forward, smarter machines and big data will play an increasing role across the systems and structures within which we live. Food systems are a good example where AI has influenced, and will continue to influence, entire systems from agricultural production through to manufacturing and retailing. Ensuring healthy diets from sustainable food systems for 10 billion people in 2050 will require not just greater food production but more efficient food systems and more effective global supply chains. AI-enabled systems will be critical for the increased production of more nutritious foods within increasingly tighter environmental boundaries.[10] Current examples include AI monitoring of small but important differences in the ways in which crops adapt to a changing climate, which can inform the generation of climate resilient crops.[11]

Despite the wealth of big data, many ethical, technical and practical challenges remain.[12] For public health, a dual challenge lies in optimising data quality while protecting privacy. For example, dietary factors are a leading risk for the burden of disease and death in Australia,[13] yet accurate tools for large-scale dietary data collection are lacking. Similar measurement and data collection challenges are evident for other behavioural risk factors.[14] Data-led decisions must also be free from bias to avoid misinterpretation and erroneous conclusions. Acquiring or collecting representative data has long been and will continue to be a challenge in public health.

Reinventing work

Employment is strongly associated with health and wellbeing. Research demonstrates a clear association between insecure employment and poor mental health, including anxiety and depression, and poor physical health, such as cardiovascular disease and raised levels of cortisol and blood pressure.[15,16] The rise of automation has led to the perception of future job insecurity, which may increasingly influence health and wellbeing as the digital revolution unfolds. Indeed, in 2015 the Committee for Economic Development of Australia found a high probability that 40% of Australia's workforce — more than 5 million people — could be replaced by automation by 2035.[17] However, workforce automation will likely come with new job opportunities and career pathways, often with higher salaries.[1] The critical question is: for whom?

The COVID-19 pandemic is also redefining the way we work and therefore our wellbeing. Enabled by the rapid adoption of digital technologies to connect remotely, working from home has become commonplace. A recent survey of 2000 Victorians found that more than 30% of participants wanted to continue to work from home in a post-COVID-19 world.[18] If remote working indeed becomes a new normal, it will be crucial that public health research seeks to understand the implications of remote working on population health and wellbeing.

COVID-19 has also resulted in an uplift of telehealth services, which have been temporarily added to the Medicare Benefits Scheme for the duration of the pandemic. Traditionally praised as a tool to improve health and wellbeing in regional and remote areas of Australia, telehealth also holds great promise for improved access to care and health in urban areas. Return on investment for a national scale rollout of home telehealth services is estimated at around five to one.[19]

Burning platforms

This digital megatrend is concerned with the rise and evolution of digital platforms that allow users to interact with one another, and which involve uploading and sharing data. Facebook, YouTube, Uber, TikTok and Amazon are digital platforms that have risen to success. These digital platforms are likely to continue to evolve and diversify over the next decade. With it will come new avenues of influence over the public and their health. Research in this area will be key to understanding both the positive and negative health implications of using these platforms as they evolve.

Existing areas of concern include the negative impact of regular digital platform use on youth mental health and wellbeing,[20] online advertising and the spread of health misinformation.[21] The consequences of public health misinformation can perhaps best be illustrated even before the rise of the internet, with the now infamous proclamation that the measles–mumps–rubella vaccine causes autism.[22] This misinformation, propagated in the late 1990s, still has currency today. In fact, its spread through the internet and social media channels in more recent times has been blamed for the global rise in measles cases, increasing by 30% in 2018, prompting the WHO to list it as one of the ten top threats to global health in 2019.[23] Furthermore, these platforms are being used by corporations to promote unhealthy products such as tobacco (through stealth marketing), alcohol and junk food.[24] This promotional activity can lead to increased consumption of such products over the life course and influence social and cultural norms in favour of them.

Invisible technology

As we become increasingly absorbed in the digital ecosystem, the increased marginal value of the physical world is likely to rise.[1] Real social interactions, experiences and nature will be increasingly craved and will be important for optimal health and wellbeing. Human-centred digital design will be core to successful digital health interventions. For example, chatbots are fast becoming mainstream health communication tools, but for widespread and long term uptake, the evolution of these chatbots will require a transition from system navigation and general question and answer communication to emotional interpretation and communication with a human-like interface. A recent example is Harlie, a human-centred chatbot application developed by the CSIRO and others, which can provide therapy education and virtual companionship for those who have special needs, are living with a health condition or are lonely.[25] The clinical usefulness of Harlie is being tested in various trials. Regardless of the outcome, it is almost certain that use of such human-like chatbots for health and wellbeing will become increasingly common in the future.

Digital dilemmas and public health recommendations for a healthy digital future

The digital revolution is no doubt an extraordinary enabler of public health. Balancing opportunities with risks will be crucial. We make the following public health recommendations for a healthy and equitable digital future.

First, the application of AI must move beyond empowering individuals to manage their own health to better understanding how the environments in which we live, work, play and age can be improved to support everyone to live healthy and prosperous lives. Digital tools and technologies should target health issues faced by Australians experiencing inequitable health outcomes, including community-tailored early childhood education programs, improved access to healthy foods, and incentives for engagement in personal health and wellbeing.[5] This will require comprehensive, high quality data on the social, economic, political, commercial and cultural determinants of health. Novel approaches to data collection will be required, which may be enabled through the application of AI technologies. For all types of data collected it will be essential that differing perspectives and backgrounds are represented and that data are scrutinised for biases. Algorithms that are based on limited or biased data could end up ingraining racial, cultural or gender prejudices.

Second, it is essential that everyone is able to make full use of digital technologies to inform their health and wellbeing. Currently, digital inclusion, like health, is socially and economically distributed. Those with lower access and affordability to new technologies and devices include older people, Aboriginal and Torres Strait Islander Australians, people living in regional and remote areas of Australia, and people living with a disability.[26] While digital inclusion is improving in Australia,[26] it must form a key part of state and national economic policy making and strategic planning in the future.

Third, improvements in data privacy, governance and trust must be prioritised and will likely require regulatory oversight. Many questions naturally arise relating to how data should be stored, who owns and who can access data, who benefits and who is being excluded, as well as whether data are being used for corporate gain over public health. New Zealand is leading the way in this regard with their approach of seeking social licence from the community for use of their personal data for social good.[27]

Fourth, it will be critical that the digital ecosystem is continually challenged and debated to uphold societal values and expectations, and that the impacts on health, wellbeing and equity are continually and rigorously examined. The long term future of digital technologies and the systems they influence are largely unknown. Deep and ongoing interrogation of the use of AI for profitable gain at the expense of public health is needed, as large transnational corporations are investing heavily in AI technologies to tap into customer behaviour, location and views in order to powerfully influence the perception, purchasing and consumption of unhealthy products.[28]

Conclusion

Significant progress has been made in applying digital technologies to improve public health. The benefits are, and will continue to be, groundbreaking. As with each of the past industrial revolutions, the digital transformation has the potential to raise income levels and profoundly influence public health research, policy and practice in the future. We must continue with the momentum that the digital transformation has already afforded public health, but do so in a way that leaves no one behind. This will require a new set of skills and an evolving open mindset for researchers and practitioners to ensure opportunities are harnessed and risks are managed and mitigated.

Acknowledgements: This chapter is part of a supplement funded by the Victorian Health Promotion Foundation (VicHealth). VicHealth is a pioneer in health promotion. It was established by the Victorian Parliament as part of the *Tobacco Act 1987* and has a primary focus on promoting good health for all and preventing chronic disease.

Competing interests: No relevant disclosures.

Provenance: Not commissioned; externally peer reviewed. ■

How to cite this chapter: Backholer K, Browne J, Wright A, et al. Digital determinants of health: the digital transformation. *Med J Aust* 2020; 214 (8 Suppl): S32–S35.

1 Hajkowicz S, Dawson D. Digital megatrends: a perspective on the coming decade of digital disruption. Brisbane: CSIRO Data61, 2019. https://data61.csiro.au/en/Our-Research/Our-Work/Future-Cities/Planning-sustainable-infrastructure/Digital-Megatrends-2019 (viewed Aug 2020).

2 Domo. Data never sleeps. https://www.Domo.com/solution/data-never-sleeps-6 (viewed Nov 2020).

3 Graham S, Depp C, Lee EE, et al. Artificial intelligence for mental health and mental illnesses: an overview. *Curr Psychiatry Rep* 2019; 21: 116.

4 Kanagasingam Y, Xiao D, Vignarajan J, et al. Evaluation of artificial intelligence–based grading of diabetic retinopathy in primary care. *JAMA Netw Open* 2018; 1: e182665.

5 Commonwealth Scientific and Industrial Research Organisation. Future of health: shifting Australia's focus from illness treatment to health and wellbeing management. Canberra: CSIRO, 2018. https://www.csiro.au/en/Showcase/futureofhealth (viewed Aug 2020).

6 Ibrahim SA, Charlson ME, Neill DB. Big data analytics and the struggle for equity in health care: the promise and perils. *Health Equity* 2020; 4: 99–101.

7 Niiler E. An AI epidemiologist sent the first warnings of the Wuhan virus. *Wired* 2020; 25 Jan. https://www.wired.com/story/ai-epidemiologist-wuhan-public-health-warnings/ (viewed Feb 2021).

8 Bogoch II, Watts A, Thomas-Bachli A, et al. Pneumonia of unknown aetiology in Wuhan, China: potential for international spread via commercial air travel. *J Travel Med* 2020; 27.

9 Hu Z, Ge Q, Li S, Xiong M. Artificial intelligence forecasting of Covid-19 in China. Last revised 1 Mar 2020. https://arxiv.org/ftp/arxiv/papers/2002/2002.07112.pdf (viewed Nov 2020).

10 Klytchnikova II, Sadler MP, Townsend R, et al. Future of food: shaping a climate-smart global food system. Washington, DC: World Bank Group, 2015. https://www.worldbank.org/en/topic/agriculture/publication/shaping-a-climate-smart-global-food-system (viewed Aug 2020).

11 Streich J, Romero J, Gazolla JGFM, et al. Can exascale computing and explainable artificial intelligence applied to plant biology deliver on the United Nations sustainable development goals? *Curr Opin Biotechnol* 2020; 61: 217–225.

12 Vayena E, Madoff L. Navigating the ethics of big data in public health. In: Mastroianni AC, Kahn JP, Kass NE, editors. The Oxford handbook of public health ethics. Oxford, UK: Oxford Handbooks, 2019.

13 Forouzanfar MH, Alexander L, Anderson HR, et al. Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet* 2015; 386: 2287–2323.

14 Lee IM, Shiroma EJ. Using accelerometers to measure physical activity in large-scale epidemiological studies: issues and challenges. *Br J Sports Med* 2014; 48: 197–201.

15 McKee-Ryan F, Song Z, Wanberg CR, Kinicki AJ. Psychological and physical well-being during unemployment: a meta-analytic study. *J Appl Psychol* 2005; 90: 53–76.

16 Van der Noordt M, IJzelenberg H, Droomers M, Proper KI. Health effects of employment: a systematic review of prospective studies. *Occup Environ Med* 2014; 71: 730–736.

17 Committee for Economic Development of Australia. Australia's future workforce? Melbourne: CEDA, 2015. https://www.ceda.com.au/ResearchAndPolicies/Research/Workforce-Skills/Australia-s-future-workforce (viewed Aug 2020).

18 VicHealth. VicHealth Coronavirus Victorian Wellbeing Impact Study: report for survey #1. Melbourne: VHPF, 2020. https://www.vichealth.vic.gov.au/media-and-resources/publications/coronavirus-victorian-wellbeing-impact-study (viewed Aug 2020).

19 Jayasena B, Celler B. Home monitoring of chronic disease for aged care. Canberra: CSIRO, 2014. https://publications.csiro.au/rpr/pub?pid=csiro:EP149317 (viewed Aug 2020).

20 Rosen LD, Lim AF, Felt J, et al. Media and technology use predicts ill-being among children, preteens and teenagers independent of the negative health impacts of exercise and eating habits. *Computers Hum Behav* 2014; 35: 364–375.

21 Swire-Thompson B, Lazer D. Public health and online misinformation: challenges and recommendations. *Annu Rev Public Health* 2020; 41: 433–451.

22 Carrieri V, Madio L, Principe F. Vaccine hesitancy and (fake) news: quasi-experimental evidence from Italy. *Health Econ* 2019; 28: 1377–1382.

23 World Health Organization. Ten threats to global health in 2019. https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019 (viewed Nov 2020).

24 Victorian Health Promotion Foundation. Under the radar: harmful industries' digital marketing to Australian children. Melbourne: VicHealth, 2020. https://doi.org/10.37309/2020.CI910 (viewed Mar 2021).

25 Commonwealth Scientific and Industrial Research Organisation. Chatbot apps for communication and social interaction therapy Australia. https://www.csiro.au/en/Research/BF/Areas/Digital-health/Developing-mobile-health-solutions/Chatbots-for-therapy (viewed Nov 2020).

26 Thomas J, Barraket J, Wilson C, Rennie E. Measuring Australia's digital divide: the Australian Digital Inclusion Index 2019. Melbourne: RMIT University and Swinburne University of Technology, 2019. https://www.csi.edu.au/media/2019_ADII_Report.pdf (viewed Aug 2020).

27 Stats New Zealand Tatauranga Aotearoa. A social licence approach to trust. 11 Dec 2018. https://www.stats.govt.nz/corporate/a-social-licence-approach-to-trust (viewed Aug 2020).

28 Montgomery K, Chester J, Nixon L, et al. Big data and the transformation of food and beverage marketing: undermining efforts to reduce obesity? *Crit Public Health* 2019; 2019: 110–117. ■

Chapter 7
Governance for health and equity: a vision for our future

Fran Baum[1], Sharon Friel[2], Phil Baker[3], Kathryn Bowen[4], Cara Büsst[5]

Summary

- Coronavirus disease 2019 has caused many people and communities to take stock on Australia's direction in relation to health, community, jobs, environmental sustainability, income and wealth.
- A desire for change is in the air. This chapter imagines how changes in the way we govern our lives and what we value as a society could solve many of the issues Australia is facing — most pressingly, the climate crisis and growing economic and health inequities.
- We present an imagined future for 2030 where governance structures are designed to ensure transparent and fair behaviour from those in power and to increase the involvement of citizens in these decisions, including a constitutional voice for Indigenous peoples.
- We imagine that these changes were made by measuring social progress in new ways, ensuring taxation for public good, enshrining human rights (including to health) in legislation, and protecting and encouraging an independent media. Measures to overcome the climate crisis were adopted and democratic processes introduced in the provision of housing, education and community development.

It is 2030 and the Victorian Health Promotion Foundation is hosting a seminar on the history of health promotion in the post-coronavirus disease 2019 (COVID-19) era. COVID-19, which is caused by the severe acute respiratory syndrome coronavirus 2, was first reported in December 2019 in Wuhan, China and led to a pandemic. Part of the seminar focused on governance for health and equity and assessed how the COVID-19 crisis helped Australia take a healthy and sustainable path out of the pandemic. This chapter is the background paper prepared for the seminar. The seminar was also informed by the chapters in this supplement on the social determinants of health (Chapter 1), Aboriginal and Torres Strait Islander health (Chapter 2), urban planning (Chapter 3), planetary health (Chapter 4), the commercial determinants of health (Chapter 5), and digital transformations (Chapter 6). The seminar used the United Nations Development Programme definition of governance as "the system of values, policies and institutions by which society manages its economic, political and social affairs through interactions within and among the state, civil society and private sector".[1]

The COVID-19 crisis and the Australian response

Australia's COVID-19 response came in the wake of a series of devastating bushfires over the summer of 2019–20 in which the government had been criticised for not listening to the advice of former fire chiefs about the risk of a devastating bushfire season. In responding to COVID-19, however, the government heeded advice from research experts.

Two governance bodies were vital to the response: (i) the National Cabinet comprising the Prime Minister and all state and territory premiers and chief ministers;[2] and (ii) the Australian Health Protection and Principal Committee, which supported the National Cabinet's decision with modelling, research and data, and comprised the chief medical or health officers from each jurisdiction. While each state and territory made their own decisions about its pandemic response measures, Australia was essentially locked down from early April until mid-June 2020. These measures were reinstated later in the year when a resurgence of the virus was seen, with the most severe lockdown in Victoria between August and October 2020.

All Australian governments also provided support to businesses and workers with JobKeeper and JobSeeker allowances and free childcare for a limited period. Other forms of government income support such as the youth allowance and parenting payments were doubled (Chapter 1).

As the pandemic receded, the debate focused on whether the Commonwealth Government would return to its former policies of austerity, which included the quest for a balanced budget, or whether there was an alternative course, which rested on economic stimulus, expansion of the public service and acceptance of the debt that would be incurred in these national building tasks. It was common for people to say we "must build back better". The pandemic had shone a light on the existing inequities and the lack of resilience in Australia's social protection and food systems. A range of social determinants and inequities in the distribution of power and resources were driving increasing health inequities.[3-5]

At first it seemed that there would be a return to the pre-COVID-19 days but then a period of civil unrest and many demands compelled the government to establish an inquiry into increasing health inequities. The Health Inequities Inquiry consulted texts such as the report of the Commission on Social Determinants of Health,[6] reports from similar inquiries in the United Kingdom[7] and the Americas,[8] Baum[9] on governing for health, and Friel[10] on health equity and climate change. The report of this inquiry was completed rapidly in late 2021. The government responded with a series of measures based on the recommendations in the report and also tied their response to another inquiry considering climate change in the wake of the 2019–20 bushfires. The resulting program was called the New Deal for Health, Sustainable and Equitable Futures (the New Deal Futures). The changes it introduced proved to be transformative and included new governance frameworks and action in all sectors.

New Deal Futures: governance principles

Central to the New Deal Futures were three important principles: the need to reconcile Australia with its colonial history and denial of Indigenous rights; the importance of an independent

[1] Southgate Institute for Health, Society and Equity, Flinders University, Adelaide, SA. [2] Australian National University, Canberra, ACT. [3] Institute for Physical Activity and Nutrition, Deakin University, Melbourne, VIC. [4] Climate Change Institute, Australian National University, Canberra, ACT. [5] Victorian Health Promotion Foundation, Melbourne, VIC. ✉ fran.baum@flinders.edu.au
• doi: 10.5694/mja2.51020

public service that provided frank and fearless advice; and policy development processes that were participative and based on cooperation across sectors.

Acceptance of the Uluru Statement from the Heart

The Uluru Statement from the Heart (https://ulurustatement.org/) call for the establishment of a First Nations voice to Parliament expressing views on important issues affecting First Nations people was accepted. The Constitution was changed following a referendum in 2024 to enshrine this body. It ensured that no legislation went to federal Parliament without consideration of its potential impact on Aboriginal and Torres Strait Islander peoples. This development built directly on the Close the Gap policy reforms which, from 2020, became more effective after implementation of the recommendations of the Coalition of Peaks concerning effective engagement with Aboriginal and Torres Strait Islander peoples.[11]

Strengthening of public sector capacities and functions

The practices of outsourcing policy advice to international accounting firms and privatising social services delivery were halted. The Commonwealth Government led this by expanding the Australian Public Service, especially its social, health and environmental policy functions. There were many new recruits imbued with a sense of public duty and pride in their work through a new program called Governing for Public Interest (GPI). GPI ensured that all public servants understood the value of the public good and how a strong, honest and independent public sector was able to pursue this. GPI rapidly spread to all states and territories. A review of the Australian Public Service in 2030 found that it rated triple E: efficient, effective and equitable.

Mandating policy development processes

Policy development processes were mandated to involve meaningful consultation with citizens and people directly affected by the proposed policy change. To support this mandate, public servants were much more effectively trained through the GPI program in participatory mechanisms. Policy also had to be culturally safe and this was achieved by following a framework developed before 2020.[12] Policy processes were designed to empower civil society in recognition that they enable the development of healthy policies and increase the quality of citizen input to public policy. This empowerment included recognition of the diversity of civil society and ensured that all groups in society had space for their voice to be heard, including people with disabilities, Aboriginal and Torres Strait Islander peoples, recent migrants and refugees, and people of all ages, social classes and genders. Another important innovation was the removal of the stipulation that non-government organisations that received government funding were not allowed to advocate on social and environmental issues,[13] thus freeing them from what had effectively been a gag order.

Policy development no longer took place in sector silos but instead operated across sectors working to achieve the liveability and wellness goals that now drove government policy. In determining how to make intersectoral work effective, GPI drew on lessons on working for health gain across sectors from the Health in All Policies[14,15] initiative and the idea of healthy public policy.[16-18]

New Deal Futures: governance changes

The work of the New Deal Futures also made changes to how progress was measured, instituted taxation reforms, introduced clear processes to manage conflicts of interest, strengthened recognition of human rights, and strengthened media freedom.

New ways of measuring societal progress

The Health Inequity Inquiry recommended the use of a broader suite of measures than Gross Domestic Product to determine how well Australia is doing. In 2028 an incoming Australian government adopted a new measure to gauge social and economic progress (based on the New Zealand Wellbeing Budget), which built on extensive work in this domain including the Genuine Progress Index,[19] the Happy Planet Index,[20] and the Australian National Development Index.[21] In addition, the potential of artificial intelligence (Chapter 6) to increase our understanding of how the environments in which we live, work, play and age can be improved to support everyone to live healthy and prosperous lives enabled new advances, such as ensuring green space was equitably distributed in urban areas.

Taxation for good governance

One of the most surprising recommendations to emerge from the Health Inequities Inquiry was a proposal to revisit many of the recommendations in the 2008–2010 Future Taxation System Review.[22] Many economists had begun questioning the "debt is bad" rhetoric of neoliberal economics.[23-26] Given the levels of debt that the federal, state and territory governments had run up in the COVID-19 period, governments were more open to higher rates of taxation and cracking down on tax avoidance. An important intervention had been a campaign run by a civil society group on how "tax evasion undermines your welfare", which pointed out how comparatively little tax transnational corporations and very rich individuals pay and how taxes buy many public goods. Many of the positive developments envisaged in Chapter 1 relating to income equity, education and housing were possible because of higher rates of taxation. This resulted in a systematic crackdown on tax evasion and an increase of the top marginal rates to those of the 1950s (around 70%).

Managing conflicts of interest

Stricter rules on potential conflicts of interest in terms of lobbying politicians, donations to political parties and funding of research were introduced. Citizens were able to point to conflicts of interest through a federal Independent Commission Against Corruption. This commission was given teeth in the form of a large staff (all trained in GPI) able to investigate complaints and bring them to a board of independent citizens. The establishment of the commission was fiercely opposed by many industry peak bodies but this was drowned out by the many citizen voices in its favour. One of the practices it was able to crack down on was the revolving door whereby retiring politicians and senior public servants were able to gain employment with large corporations because of their inside knowledge of the public realm.[27,28] Further moves that reduced the risk of conflicts of interests included mandating a transparent register of political lobbyists and capping donations to political parties. Mechanisms to manage the influence of corporate interests on public health[29] were adopted. These included measures to prevent the revolving door of personnel between industry and governance, the protection of whistle blowers and the public disclosure of lobbying activities and donations.

Human rights and democracy

The Health Inequities Inquiry accepted that a human rights perspective is vital to reducing inequities,[30] and it coupled the importance of this issue with the need to increase democratic participation. The 2020s saw a series of measures introduced to protect human rights and extend democracy. Central to these was the introduction of a Bill of Rights that guaranteed the existing rights in the Constitution and extended these to include the right to education and health care.

Media freedom

The New Deal Futures recognised the importance of encouraging media diversity and independent journalism to the democratic and participative society it wanted to flourish. Australian-owned media companies were given generous tax breaks, especially if they enabled the production of both national and local news and debate. Citizen journalism was also encouraged as part of the process of strengthening civil society. It was also recognised that it was not healthy to have one company dominating the Australian media landscape.[31] By 2025, laws had therefore been passed to ensure more diversity of ownership and banning any one company from owning more than 30% of media.

How the New Deal Futures responded to the climate crisis

A coalition of environmental lobby groups, including the Climate and Health Alliance, and the growing renewables industry (which was gaining traction as a major employer) successfully won enough support in Parliament for the Climate Emergency Response Initiative (CERI). A governance council was established for CERI and a new federal department was created. Many new programs and community initiatives ensued. The following examples provide an idea of their scope and reach.

- A Green Youth Corp was established to restore degraded areas of country, guided by traditional owners. The Green Youth Corp introduced many young Australians to Aboriginal and Torres Strait Islander culture and encouraged a love of country and deep desire to reverse ecological damage.
- A fund was created to support rural and remote regions and towns and provide low rents to Green Youth Corp members to live and work in these towns to revitalise them.
- Communities in outer suburban areas were given access to significant funding from CERI and worked with environmentalists to green their suburbs. Wherever possible, local schools were involved in the initiatives and local people were employed on them. After ten years these suburbs were transformed from being car-centric with uninteresting landscapes to ones that were green, walkable, encouraging of neighbourhood conviviality, and providing interesting and diverse destinations.
- The government invested much more heavily in the Clean Energy Finance Corporation. Its investments drew on South Australia's transition to a much cleaner energy profile,[32] and provided support for renewable energy by progressive reduction of subsidies to fossil fuel energy. Care was taken to ensure jobs were available for those exiting high carbon industries.

Finally, with CERI in place there has been strong bipartisan support for signing international climate agreements. Australia has pushed for higher targets and has become a global leader by being able to point to its own successes in dealing with the climate emergency.

Key New Deal Futures programs to promote health equity

We have seen in Chapter 1 that the social determinants of health were tackled primarily through policies that ensured all Australians had decent incomes and housing and good access to education. Each of these areas demonstrates the ways in which these sectors were successful by introducing changes to how they were governed, including how they improved health in rural and remote areas. A common thread was that governance was made more participatory — those governing were more open to input from civil society and less influenced by vested interests (usually profit motive) than those arguing for the public good. The measures described below are the changes made within states and local communities to support these governance principles.

Housing

The Health Inequities Inquiry highlighted housing unaffordability as a major cause of inequity both intergenerationally and by socio-economic status. The New Deal Futures instituted the Green Social Housing Economic Stimulus Package (Chapter 1). As well as providing 30 000 social housing units, the scheme introduced participatory governance for housing tenants. It was supported by locally run training programs to provide people with the skills to participate in the governance of their housing. By 2030 this measure enabled better management of housing and gave tenants more control over their housing.

Urban planning for sustainability and equity

Australian cities are spatially unequal.[33] The Health Inequities Inquiry highlighted the need to tackle this problem urgently, as well as the need to make cities more sustainable and supportive of health. The New Deal for Cities program was introduced in 2025 and provided for the upgrade of outer suburban areas, using a governance process that involved people in planning and enabled residents to discuss what would improve their suburb. People had more time for civic involvement because they were more likely to work from home or locally and so spent less time travelling. Ideas flowed and areas that previously were unsafe, not walkable and unattractive have now come alive with local cafes, improved footpaths and well maintained parks.

Education

Another recommendation of the Health Inequities Inquiry concerned the funding of public education. A New Deal for Education agreement was signed with the states and territories, covering early childhood education through to universities. Schools and universities came to be governed much more democratically, with staff and students having a strong voice and local communities more welcome on campuses. They were also decolonised so that, for instance, courses on Australia's Indigenous heritage were mandated in every degree.

Healthy Communities Initiative

The Health Inequities Inquiry recognised that many rural communities and outer suburban areas were the sites of significantly more disadvantage and provided less healthy environments than those near city centres. Rates of most chronic diseases,

including mental illness, were higher in rural and remote areas.[34] Community-governed community health centres were established to provide individual care as well as group programs and community health promotion. By 2030 they had contributed to reducing the excess burden of disease in rural, remote and outer suburban areas. The national Healthy Communities Initiative funded libraries, neighbourhood houses and community centres in low socio-economic areas to develop new programs to encourage people of all ages to be healthy. Many innovative programs sprang up around the country, including community gardens with coffee shops, locally produced newspapers and co-operatively owned supermarkets. Once again, the ingredient for success was that local communities were in charge and they felt the "nothing for us without us" rhetoric had been honoured.

Final thoughts

Here we are back in 2021 and we can hear many voices saying the visions we have provided are "pie in the sky" and those of dreamers rather than realists. However, all of these suggestions have been tried in other places. They all have evidence behind them suggesting that they could result in a more healthy, equitable and sustainable society. COVID-19 has laid bare the inequities we have learnt to tolerate and has therefore given us a warning that all is not right with our world. COVID-19 has also given us a chance to stop and think how we can create a better society. Envisaging a better governed future is an important way of doing this.

Acknowledgements: This chapter is part of a supplement funded by the Victorian Health Promotion Foundation (VicHealth). VicHealth is a pioneer in health promotion. It was established by the Victorian Parliament as part of the *Tobacco Act 1987* and has a primary focus on promoting good health for all and preventing chronic disease.

Competing interests: No relevant disclosures.

Provenance: Commissioned; externally peer reviewed. ■

How to cite this chapter: Baum F, Friel S, Baker P, et al. Governance for health and equity: a vision for our future. *Med J Aust* 2021; 214 (8 Suppl): S36–S40.

1 United Nations Development Programme Bureau for Development Policy. Towards human resilience: sustaining MDG progress in an age of economic uncertainty. New York: UNDP, 2011: 287. https://digitallibrary.un.org/record/3828493?ln=en (viewed Mar 2021).

2 Menzies J. Explainer: what is the National Cabinet and is it democratic? *The Conversation* 2020; 31 Mar. https://theconversation.com/explainer-what-is-the-national-cabinet-and-is-it-democratic-135036 (viewed Mar 2021).

3 Adair T, Lopez A. Widening inequalities in premature mortality in Australia, 2006–16. *Aust Popul Stud* 2020; 4: 37–56.

4 PHIDU Torrens University Australia. Inequality graphs: time series. https://phidu.torrens.edu.au/social-health-atlases/graphs/monitoring-inequality-in-australia/whole-population/inequality-graphs-time-series (viewed Mar 2021).

5 Musolino C, Baum F, Womersley R, et al. SA: the heaps unfair state. Adelaide: South Australian Council of Social Service and Southgate Institute for Health, Society and Equity, Flinders University, 2020. https://www.sacoss.org.au/sa-heaps-unfair-state (viewed Mar 2021).

6 World Health Organization Commission on Social Determinants of Health. Closing the gap in a generation: health equity through action on the social determinants of health. Geneva: WHO, 2008. https://www.who.int/social_determinants/final_report/csdh_finalreport_2008.pdf (viewed Mar 2021).

7 Marmot M, Allen J, Goldblatt P, et al. Fair society, healthy lives: the Marmot review. Strategic review of health inequalities in England post-2010. London: Institute of Health Equity, 2010. http://www.instituteofhealthequity.org/resources-reports/fair-society-healthy-lives-the-marmot-review/fair-society-healthy-lives-full-report-pdf.pdf (viewed Mar 2021).

8 Pan American Health Organization. Just societies: health equity and dignified lives. Executive summary of the report of the Commission of the Pan American Health Organization on Equity and Health Inequalities in the Americas. Revised ed. Washington, DC: PAHO, 2019.[Author, revised edition published]

9 Baum F. Governing for health: advancing health and equity through policy and advocacy. New York: Oxford University Press, 2019.

10 Friel S. Climate change and the people's health. Oxford, UK: Oxford University Press, 2019.

11 Coalition of Aboriginal and Torres Strait Islander Community-Controlled Peak Organisations. A report on engagement with Aboriginal and Torres Strait Islander peoples to inform a new national agreement on Closing the Gap. Canberra: Coalition of Peaks, 2020. https://apo.org.au/sites/default/files/resource-files/2020-06/apo-nid306455.pdf (viewed Mar 2021).

12 Mackean T, Fisher M, Friel S, et al. A framework to assess cultural safety in Australian public policy. *Health Promot Int* 2020; 35: 340–351.

13 Redfern T. Non-advocacy clauses and the conservative suppression of Australian NGOs. *The Medium* 2017; 9 Feb. https://medium.com/@tim.redfern/non-advocacy-clauses-and-the-conservative-suppression-of-australian-ngos-10dfdddf6f12 (viewed Mar 2021).

14 Baum F, Delany T, MacDougall C, et al. Ideas, actors and institutions: lessons from South Australian health in all policies on what encourages other sectors' involvement. *BMC Public Health*. 2017; 17: 1–16.

15 Cook S, Leppo K, Ollila E, et al. Health in all policies: seizing opportunities, implementing policies. Helsinki: Ministry of Social Affairs and Health, 2013.

16 Kickbusch I, Gleicher D. Governance for health in the 21st century. Copenhagen: WHO Regional Office for Europe, 2012.

17 Kickbusch I, McCann W, Sherbon T. Adelaide revisited: from healthy public policy to Health in All Policies. *Health Promot Int* 2008; 23: 1–4.

18 Milio N. Promoting health through public policy. Philadelphia: F. A. Davis, 1981.

19 Kubiszewski I, Costanza R, Franco C, et al. Beyond GDP: measuring and achieving global genuine progress. *Ecological Econ* 2013; 93: 57–68.

20 New Economics Foundation. Happy Planet Index. http://happyplanetindex.org/ (viewed Aug 2020).

21 Australian National Development Index. http://www.andi.org.au/ (viewed Aug 2020).

22 Henry H, Harmer J, Piggot J, Ridout H, Smith G. Australia's future tax system. Canberra: Commonwealth of Australia, 2010. https://treasury.gov.au/review/the-australias-future-tax-system-review/final-report (viewed Feb 2021).

23 Kelton S. The deficit myth: modern monetary theory and the birth of the people's economy. London: John Murray, 2020.

24 Waring M. Counting for nothing: what men value and what women are worth. Wellington: Allen & Unwin, 1988.

25 Daly HE, Cobb JB. For the common good: redirecting the economy toward community, the environment and a sustainable future. London: Green Print, 1990.

26 Denniss R. Dead right: how neoliberalism ate itself and what comes next. *Quarterly Essay* 2018; QE70 - June.

27 Rennie G. The revolving door: why politicians become lobbyists, and lobbyists become politicians. *The Conversation* 2016; 22 Sept. https://theconversation.com/the-revolving-door-why-politicians-become-lobbyists-and-lobbyists-become-politicians-64237 (viewed Mar 2021).

28 Knaus C. Australian government powerless against lobbyists with hidden interests, audit finds. *The Guardian* 2020; 29 June. https://www.theguardian.com/australia-news/2020/jun/29/australian-government-powerless-against-lobbyists-with-hidden-interests-audit-finds (viewed Mar 2021).

29 Mialon M, Vandevijvere S, Carriedo-Lutzenkirchen A, et al. Mechanisms for addressing and managing the influence of corporations on public health policy, research and practice: a scoping review. *BMJ Open* 2020; 10: e034082.

30 World Health Organization. Human rights and health. 29 Dec 2017. https://www.who.int/news-room/fact-sheets/detail/human-rights-and-health (viewed Aug 2020).

31 Mahler J, Rutenberg J. How Murdoch's empire of influence remade the world. *New York Times Magazine* 2019; 3 Apr. https://www.nytimes.com/interactive/2019/04/03/magazine/rupert-murdoch-fox-news-trump.html (viewed Mar 2020).

32 McGreevy M, MacDougall C, Fisher M, et al. Expediting a renewable energy transition in a privatised market via public policy: the case of

South Australia 2004–18. *Energy Policy* 2021; 148: 111940.

33 Hulse K, Pawson H, Reynolds M, Herath S. Disadvantaged places in urban Australia: analysing socio-economic diversity and housing market performance. Melbourne: Australian Housing and Urban Research Institute, 2014. https://www.ahuri.edu.au/__data/assets/pdf_file/0016/2176/AHURI_Final_Report_No225_Disadvantaged-places-in-urban-Australia-analysing-socio-economic-diversity-and-housing-market-performance.pdf (viewed Mar 2021).

This supplement was sponsored by

VicHealth®

MJA
The Medical Journal of Australia

AMPCo

Australasian Medical Publishing Company Proprietary Limited • ABN 20 000 005 854

Suite 1 Level 19, Town Hall House, 456 Kent Street, Sydney, NSW 2000 Australia

Telephone: 02 9562 6666 • International: +61 2 9562 6666 • Facsimile: 02 9562 6600 • Email: mja@mja.com.au