

Waiora: the importance of Indigenous worldviews and spirituality to inspire and inform Planetary Health Promotion in the Anthropocene

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Abstract: We now live in a new geological age, the Anthropocene – the age of humans – the start of which coincides with the founding of the International Union for Health Promotion and Education (IUHPE) 70 years ago. In this article, we address the fundamental challenge facing health promotion in its next 70 years, which takes us almost to 2100: how do we achieve planetary health? We begin with a brief overview of the massive and rapid global ecological changes we face, the social, economic and technological driving forces behind those changes, and their health implications. At the heart of these driving forces lie a set of core values that are incompatible with planetary health. Central to our argument is the need for a new set of values, which heed and privilege the wisdom of Indigenous worldviews, as well as a renewed sense of spirituality that can re-establish a reverence for nature. We propose an Indigenous-informed framing to inspire and inform what we call planetary health promotion so that, as the United Nations Secretary General wrote recently, we can make peace with nature.

Keywords: Planetary health, spirituality, Anthropocene, healthy cities/healthy communities, Indigenous worldviews, core values, Indigenous knowledge

Introduction

'The conference participants call on the global community to urgently act to promote planetary health and sustainable development for all, now and for the sake of future generations.'

Rotorua Statement – IUHPE 2019 (1)

'Waiora is an Indigenous concept of ... Aotearoa New Zealand which expresses the interconnections between peoples' health and the natural environment, and the imperative of sustainable development' (1).

It lies at the heart of the new era of health promotion that we must create if we are to ensure health for all by the year 2100.¹

We now live in the Anthropocene, the age of humans (*anthropos* being the Ancient Greek word for humans), a new geologic epoch in which the strata now being deposited record the massive and rapid global ecological changes brought on by humanity (2). Note that this new age – for which the suggested start date coincides with the founding of IUHPE 70 years ago – is not about humanity, but is

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due to the actions of humanity – the social, economic and technological driving forces we have created that are changing the Earth's natural systems.

At the heart of these driving forces lie a set of core values – rooted in Judaeo-Christian thought (3), the Enlightenment and Modernity (4) – that are incompatible with planetary health, which is: 'The health of human civilisation and the state of the natural systems on which it depends (5, p. 1973)'.

This article addresses the fundamental challenge facing health promotion in its next 70 years, which takes us almost to 2100: how do we help to change the current unsustainable trajectory for humanity, a trajectory that threatens the stability of our societies and the health not only of humanity but also of myriad other species with whom we share the Earth?

Our contribution is co-authored by a collaborative group of Indigenous and non-Indigenous health promoters from varied positions who seek collectively to elevate and centre Indigenous world views and voices as critical to the future of a healthy planet. As a collective, we acknowledge the oppression, marginalisation and exploitation suffered by Indigenous peoples, the desecration of their cultural and traditional landscapes, and the erosion of their rights to be sovereign in their respective nations (6). We speak to non-Indigenous health promotion communities to engage in a process of critical self-reflection so that together we may become better equipped to appropriately welcome and respect, believe and validate, centre and value Indigenous knowledges and contexts (7). Furthermore, in keeping with the challenge of the United Nations (UN) Declaration on the Rights of Indigenous Peoples (8), we support the reclamation, restoration and celebration of Indigenous culture, identity and belonging and advocate that these principles must underpin the future of health promotion.

We argue that health promotion can offer an example of leadership by promoting values that privilege the long-standing wisdom of Indigenous worldviews and re-establish a reverence for nature. As the UN Secretary General recently stated with respect to Indigenous people in the context of the growing ecological crises, 'it is time to heed their voices, reward their knowledge and respect their rights (9)', adding later that the challenge to 'Make peace with Nature' must also align with respect for Indigenous peoples (10). These challenges inform

our article's focus, learning from Indigenous knowledges and spirituality to inform and inspire what we call planetary health promotion.

Welcome to the Anthropocene

It is not within the scope of this paper to describe the full extent of the global ecological changes we face, the human driving forces behind them or their health implications; we recognise that these phenomena are inextricably linked with the colonisation of other countries by British and European powers in the 15th and 16th centuries, the rise of capitalism in its wake with its voracious appetite for the Earth's resources, the subsequent dispossession of Indigenous peoples from their lands, the loss of relationship with their traditional landscapes and their ongoing suffering as a result of colonial oppression (11–14).

The accompanying Supplementary File 2 offers unfamiliar readers a description of key transformations seen in recent years and the changes we must expect in coming years if we do not profoundly change how we humans interact with nature.

In more recent years – just over two generations^b – humanity as a whole (but in fact, mainly people in high-income industrialised countries) has created a 'great acceleration' in human, social and technological development, while at the same time creating a 'great decline' in the capacity and functioning of many Earth systems (15).

Humans have become a force of nature that has started to undermine and unbalance the Earth's natural systems. Since these natural systems constitute the most fundamental ecological determinants of health (16), undermining them is a profound threat to health; climate change tipping point cascades alone may pose 'an existential threat to civilization (17)'.

So, while there has been a significant improvement in many aspects of health and wellbeing for many people since 1950, and this is expected to continue, it has come at a huge and unsustainable cost in ecological degradation, which has profound implications for health in the future. As the Rockefeller-Lancet Commission on Planetary Health put it:

'we have been mortgaging the health of future generations to realise economic and development gains in the present (5, p. 1973)'.

Looking 70 years ahead takes us forward just over two generations to 2091, which is within the global average life expectancy at birth in 2018 of 72.4 years (18), meaning many infants born today will still be alive then. But it is difficult, if not impossible, to predict where we will be in another 70 years. To get some sense of the challenge, try to imagine predicting, in 1950, the Internet, Google and Twitter; the extent of climate change, microplastic pollution of the ocean and species extinction in 2020; or the rejection of smoking and the acceptance of gay marriage in many parts of the world. Many of these were then in the realm of science fiction!

Nonetheless, we can be reasonably sure that population growth will continue at least until 2050, and probably until 2100, as will urbanisation and economic development. As a result, states the United Nations Environment Programme (UNEP)'s GEO-6 Environmental Outlook, 'the demand for food, water and energy will strongly increase towards 2050 (19, p.486)'.

GEO-6 finds that for 9 of the 10 natural resource base areas of concern, not only will the target for improvement by 2050 not be met, but the trend is in the wrong direction and the situation is actually expected to be worse – often, far worse – than the situation in 2020. This will have profound implications for health; if ecosystems decline or collapse, all bets about the future health of the population are off!

The implications of the Anthropocene are now attracting the attention of global leaders at the highest level. Most notably Antonio Guterres, Secretary General of the UN, has stated 'Humanity is waging war on nature. This is senseless and suicidal... Making peace with nature is the defining task of the coming decades (10, p.4)'.

As Mother Earth is the sustainer of all life, the health sector and health promotion are therefore obliged to seek solutions to address these concerns. In responding to this call, we call attention to Indigenous voices and spirituality as critical to next-generation health promotion practices.

Indigenous peoples' voices and knowledge in planetary health

'We call on the health promotion community and the wider global community to make space for and privilege Indigenous peoples' voices and

Indigenous knowledges in taking action with us to promote the health of Mother Earth and sustainable development for the benefit of all'

Waiora – Indigenous Peoples' Statement, IUHPE 2019 (20)

The global challenges noted above have raised greater awareness across the world of the inherent interdependence of all forms of life, and the planet as one system. But this reality is not new to the 476 million Indigenous peoples of the world (21). In fact, viewing humanity as deeply connected with the environment is a central element of Indigenous knowledge systems. This is aptly demonstrated in the Pacific Indigenous concept of whenua or fonua (22).

In Te Reo Māori, the language of the Indigenous peoples of Aotearoa New Zealand, whenua means the land and people are one. As Durie noted, 'Although there is no simple definition of Indigenous peoples, two important characteristics are an ancient relationship with some geographical place and an ethnic distinctiveness from others now living alongside them (23)'.

So central is this concept of being one with the environment in many other Pacific Indigenous cultures, such as Tonga, that the placenta, the physical plane, the grave and the world hereafter are all called the fonua, the Tongan cognate for whenua (22). Fonua reflects a profound understanding of the planet as a web of life, a complex system of unity in diversity, where all elements are connected coherently in a dynamic relationship for its harmonious and holistic wellbeing. The part is the whole, the whole is the part.

The two Legacy Statements of the 2019 IUHPE World Conference on Health Promotion echo this understanding, with the Waiora Indigenous Peoples' Statement (20) observing:

'Core features of Indigenous worldviews are the interactive relationship between spiritual and material realms, intergenerational and collective orientations, that Mother Earth is a living being – a "person" with whom we have special relationships that are a foundation for identity, and the interconnectedness and interdependence between all that exists, which locates humanity as

part of Mother Earth's ecosystems alongside our relations in the natural world'.

Meanwhile, its sister statement, the Rotorua Statement (1) noted that planetary health

'builds on Indigenous peoples' principles of holism and interconnectedness, strengthening public health and health promotion action on ecological and social determinants of health. It puts the wellbeing of people and the planet at the heart of decision-making'.

After centuries of colonisation and oppression, Indigenous Peoples and their knowledge are recognised as valuable contributors to the future of humanity and the global challenges it is now facing. The UN Department of Social and Economic Development Affairs (24) acknowledges 'the crucial role of Indigenous knowledge for achieving the Sustainable Development Goals (SDGs) and for addressing the most pressing global problems' is gaining international traction. Additionally, Indigenous knowledge also 'offers tremendous opportunities in such areas as land management, conservation, and scientific, technological and medical research'. UN Secretary General Antonio Guterres (9) noted:

'...Indigenous knowledge, distilled over millennia of close and direct contact with nature, can help to point the way. Indigenous peoples make up less than 6 per cent of the world's population yet are stewards of 80 per cent of the world's biodiversity on land. Already, we know that nature managed by indigenous peoples is declining less rapidly than elsewhere. With indigenous peoples living on land that is among the most vulnerable to climate change and environmental degradation, it is time to heed their voices, reward their knowledge and respect their rights'.

Referring to our collective effort to counter coronavirus disease 2019 (COVID-19), Guterres (9) also pointed out that, 'in overcoming the pandemic, we can also avert climate cataclysm and restore our planet. This is an epic policy test. But ultimately this is a moral test'. Indigenous knowledge offers myriad lessons for this moral test,

especially spiritual dimensions (as discussed below), and also underscores the benefits of disturbing harmful patterns across numerous domains (11–14,23–25).

A practical example of how Indigenous knowledge can evolve into a sociopolitical tool to improve environmental concerns is evidenced by the Māori concept of Kaitiakitanga, (understood broadly as guardianship or custodianship). Kaitiakitanga is a cultural framework and ethic that enables Māori oversight of conservation and environmental concerns in partnership with local government and other organisations in relation to the Resource Management Act of New Zealand, and is a means for transforming Māori involvement and expression in new political and legal contexts (26). Formalised and equal relationships between Indigenous groups and others to address these common concerns may be a way forward.

As noted in the Rotorua Statement, much of the ecological devastation caused by unsustainable economic development across the world is founded on the erroneous human construct that humans are separate from the environment, which is seen as an unlimited resource to be exploited. This is the opposite of the Indigenous wisdom that there is an inseparable interaction and contiguity between humanity and the natural environment (14, 27).

The part cannot undermine the whole upon which it depends, and of which it is a part. Indigenous health promotion models (22, 23) show that, as custodians, humans should not only live sustainably within the environment, but must also adopt a collaborative and equitable approach in their relationship with fellow human beings. This is why fundamental, guiding principles such as reciprocity, love, respect, humility and justice are pivotal to the worldview and daily, practical living of Indigenous peoples.

A key task for health promotion in the 21st century is to create spaces where Indigenous Peoples can be recognized as leaders, inspiring and informing ways to incorporate these values, principles and ways of knowing into health promotion practice. As exemplified by the examples here, Indigenous leadership is offering new opportunities for the health community to fulfil its obligations to the future (28, 29).

The place of spirituality in planetary health

Spirituality is another facet of human life that offers pathways to re-engage with humanity's deep connection with the natural world (30) and to foster environmental awareness, activism and wellbeing in ways that can enhance both health promotion and planetary health. Due to growing evidence and principle-based approaches (31, 32), spirituality is increasingly evident in health and wellbeing models and health policy across the globe (33). While contentious issues regarding definitions remain (34), religion in current health scholarship may be understood as a subset of spirituality, with more focussed institutional and belief structures. Spirituality definitions are multifactorial and vary between individuals and groups, but include beliefs and values, meaning and purpose, identity, connectedness, awareness and transcendence (35). The Bangkok Charter (36) included spirituality explicitly in its health promotion definition, as do many wellbeing definitions such as the hospice framework (37) and Indigenous models (22, 23). From an Indigenous perspective, spirituality is central to holistic wellbeing. As noted earlier, the 2019 Waiora Indigenous Legacy Statement recognized 'Core features of Indigenous worldviews are the interactive relationship between spiritual and material realms ...'; and that 'Mother Earth is a living being (20)'.

While acknowledging the growth of 'nones/non-affiliated' and the 'spiritual but not religious' (38), in the post-secular world, over 80% of the global population is actively religious (39). Therefore, those with religious spiritualities need to be able to connect their beliefs with the ethical and moral issues of the global ecological crisis, and become active protagonists in naming the spiritualities that can underpin future policies and practice.

The ecological crisis of the Anthropocene is unequivocally humanly induced, but humanity's inter-relationship with nature has not always been dysfunctional. In keeping with Indigenous worldviews, and often counter to the disconnection created by colonial norms, experiences of the natural world continue to inspire spiritual wellbeing (40), spiritually related positive effect (41) and eudaimonic wellbeing (42).^c Many religious traditions have acknowledged and harnessed this spiritual

connection with the Earth – from hunter-gatherers' worship of nature, to the Indigenous personification of land and sky (43) and formal religions' recognition of the sacredness of the land (44).

Widespread spiritual aridity or void (45, 46) and 'despiritualisation (47, p. 28)' may have led us to this crisis, and dominant Anthropocene values and spiritualities may have compounded the problem that has led us to such exploitation of the planet. For example, the Christian domination discourse from Genesis 1:26–28, suggests that humans have dominion over the Earth, the planet and animals, which has resulted in justification for exploitation (48). Bioreductionism, scientific reductionism, extreme materialism and neoliberal economics have all contributed to 'life-denying and life harming' activities (47, p.28) and led to a 'dysfunctional relationship with the natural environment (40, p.408)', facilitating the exploitation and commodification of the natural world. These activities are not sustainable, nor are they equitable. Exploitation and commodification of spiritualities (49) need to be considered in these analyses – but in contrast to the dysfunctional spiritualities of neoliberal economics, an eco-spiritual lens will highlight their impaired vision for sustainable living.

Seldom in mainstream health promotion and planetary health action do we work with Indigenous peoples' spiritualities and institutions that can work to empower communities and contribute to advancing the health and wellbeing of all, including the health of the environment (23). Proactively highlighting eco-spiritual approaches has the potential to affect fundamental values and behaviour.

Similarly, it is important to acknowledge current environmental movements within faith-based organisations, where the dominion narrative is reinterpreted as a 'stewardship or creation care', one that highlights justice, duty and responsibility towards both the Earth and future generations (48, p.591). Pope Francis' encyclical *Laudato Si* 'critiques consumerism and irresponsible development, laments environmental degradation and global warming (50, p.51)', calling for unified and global action. Similarly, Berry, in *Egri* (40), calls for a new story of transformational change challenging the dominion narrative, instead offering a stewardship approach (48) that has some similarities to the *kaitiakitanga* or guardianship approach expressed by Māori long before Berry (26).

The Bahá'í Scriptures articulate a conceptual framework that describes nature as a 'reflection of the sacred' that should be valued and respected. It further proposes an approach that includes a deep understanding of the natural world and its role in humanity's collective material and spiritual development (51). This reflection of the sacred resonates with ancient Indigenous concepts of people as trustees, or stewards of the planet's resources and biological diversity, and their responsibility to preserve and sustain the natural order of the environment.

'Therefore, sustainable environmental management must come to be seen not as a discretionary commitment mankind can weigh against other competing interests, but rather as a fundamental responsibility that must be shouldered – a prerequisite for spiritual development as well as the individual's physical survival (51).'

We know from the health literature that spirituality is important to health outcomes (32). Similarly, pluralistic and inclusive spirituality is expressed by many people across the globe (44). To enhance 'Earth stewardship', noting human wellbeing 'depends on nature', Chapin *et al.* (52) suggest encouraging a 'sense of place', while including the 'spiritual dimensions of ecosystems (p. 90)' is something that health promoters could make part of their planetary health lens. The call to 'reduce unnecessary consumption' and promote 'environmental citizenship (52, p. 90)' fits appropriately into a planetary health approach. The spiritual impulse, one that demands consideration and investigation of our values and beliefs, our worldviews – calls for an integrative holistic and compassionate spirituality – challenging the foundations of selfish political and economic power that creates human and planetary harms (53).

A pro-spiritual lens will draw on many of the values that health promotion espouses, such as interdependence, equity, love and kindness (54), that offer hope for a sustainable planet. Gerhardt-Strachan highlights the lack of spiritual discourse in health promotion, calling for its inclusion 'for effective human and planetary wellbeing (55, p.1)'. We need to take this seriously and make spiritualities

explicit and ecologically responsible in the new planetary health promotion framework.

People, place and planet: toward a new era of planetary health promotion

Health promotion is action-oriented: as a concept, a field and a form of practice, it invokes action (to 'promote' health). Recognising the human-created degradation of the living systems and planet we depend on, a central challenge for all health promoters – and all who aspire to promote health – in the 21st century is to identify and prioritise health promotion actions that align with the imperatives of Indigenous and spiritual perspectives identified in earlier sections of this paper. The converging crises of climate change, biodiversity loss and pollution (10) call for a new era of practices that focus on regeneration, reciprocity and care in ways that span people, place and planet (56).

Importantly, in keeping with the wisdoms of Indigenous perspectives, and the dynamic, and expanding efforts underway in Indigenous Health Promotion (22,23,28), this new era is not 'all new', and can be invigorated by re-calling and weaving together ideas and approaches from past and present that better serve our current and future context, including individual and collective spiritualities. A foundational health promotion idea deserving reinvigoration to guide future planetary health promotion practice is the idea of 'reciprocal maintenance' from the Ottawa Charter; the need to 'take care of each other, our communities and our natural environment (57)'.

Put simply: health promotion practice has the opportunity to be transformational if reoriented to all three of these at once: taking care of each other (people), our communities (within place) and our natural environment (planet). Mutual reciprocity fuels the creative co-benefits of both/and/all rather than the diminishment of either/or approaches.

Health promotion practices that focus solely on the 'social' (equity, diversity, inclusion, etc.), while waiting for others to deal with the 'ecological' (the environment and living systems we depend on) – or vice versa – are no longer sufficient if the goal is to promote health for both current and future generations. Health promotion practices that focus explicitly on both the social ('each other, our communities') and the ecological ('our natural

environment’) have the potential to fulfil the socio-ecological promise of the Ottawa Charter.

Leveraging on existing strengths and processes, health promotion has the potential to provide leadership and vision for an overdue era of overtly eco-social approaches to public health (58,59) that overcome long-standing ecological blindness (60–62) and orient to intergenerational and indeed inter-species equity (56). This orientation realigns with the wisdom of Indigenous practices that orients to a shared future across generations for all our relations (human kin, alongside the four-legged, winged, finned, rooted and nonrooted relations (14,63) in ways that respond to converging and increasingly urgent calls for all sectors to work together to ‘heal the web of life’ (56) and ‘make peace with nature’ (10).

It is important not to be naïve about the challenging power-dynamics associated with these opportunities and calls for change. Powerful influences are at play, leveraging hundreds of years of colonising, racist and capitalist processes, to ensure that entrenched notions of competition, supremacy, disconnection and individualism are given primacy. Countering this are long-standing and converging commitments to reciprocity, connections and interrelatedness, each reflected, in different ways, in the Indigenous worldviews, spiritual perspectives and ecological perspectives that are receiving renewed attention (14,28,29,61).

While not new, this perspective reinvigorates calls for an eco-social approach to healthy settings bringing together people, place and planet, and, at the same time, incorporating Indigenous and spiritual perspectives and approaches. Can we, for example, combine the concept of healthy settings such as cities and communities, schools, hospitals and workplaces with their complementary ‘sustainable’ or ‘green’ equivalents?

The good news is that linking ‘healthy settings’ with ‘green settings’ (64) creates a new realm of potential synergies among health, equity and ecosystem considerations, with many health co-benefits stemming from sustainable ways of life. One way to consider the fertile interface between different types of settings and the different levels of action is to consider the interface of ‘healthy settings’ and ‘green settings’ in an approach that was developed in conjunction with Population Health in British Columbia (BC)’s Northern Health Authority (65) – see Figure 1 in the Supplementary file 1.

Combining ‘healthy’ and ‘green’ settings encourages new conversations, creating points of synergies between the healthy edge of ‘green’ (environmental) settings such as parks (66) and watersheds (62,67), with a reinvigorating commitment to pay more attention to the green (ecological) edge of traditional healthy settings work in healthy schools, workplaces, healthcare or cities, communities or islands (68). In doing so, we need to engage with what might be seen as ‘unusual allies’ (58,59), including the broad spectrum of faith congregations and spiritual communities, as well as among Indigenous people.

Next generation practices are already emerging – reflecting a new era of health-promoting approaches and place-based connections spanning ecosystems, community and health and well-being in ways that honour Indigenous knowledges within cities, islands, and regions (28,65,68). Nesting health promotion within healthy eco-social settings creates synergies for a healthy, just, and sustainable future (69) of healthy ‘One Planet’ communities (70).

Implications for the education and training of ‘planetary health promoters’ and the incorporation of this within professional education and training are the focus for the international collaboration (and future position papers) being developed by our IUHPE Global Working Group on Waioria Planetary Health.

Conclusion

Our task as health promoters is not to predict the future of health, but to imagine and then try to create the future for health that we wish to achieve – our preferable future for health. If our vision is one of health for all within the ecological limits of the Earth, then we have to ask how that is to be achieved.

It will require a markedly different society and economy, driven by a set of values that are radically different in their profound recognition of our reciprocity and interdependence. Considering both Indigenous and spiritual perspectives in arriving at a new, healthier set of relationships between people and the planet in the future is essential to our next-generation of health promotion practice.

The challenge for planetary health promotion in the 21st century is simple:

‘How do we improve the health of the population – especially the health of the most disadvantaged

and vulnerable – while making peace with the Earth?'

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Supplemental material

Supplemental material for this article is available online.

Notes

1. Readers with long memories will recognise that this is a re-statement of the World Health organisation's 1977 goal of 'Health for all by the Year 2000'. We did not achieve it then, we must achieve it now.
2. A generation is roughly 30 years – 'three generations per century (33 years each) for male lines, 3 1/2 generations per century or seven in two centuries (29 years each) for female lines' Excerpted from 'How long is a generation? Science provides an answer' by Donn Devine, CG, FNGS on the International Society of Genetic Genealogy Wiki https://isogg.org/wiki/How_long_is_a_generation%3F_Science_provides_an_answer
3. Eudaimonic – 'living a life of virtue in pursuit of human excellence'. From Niemiec CP. Eudaimonic well-being. In: Michalos AC (ed.). *Encyclopedia of Quality of Life and Well-Being Research*. Springer, Dordrecht. 2014. https://doi.org/10.1007/978-94-007-0753-5_929

References

1. IUHPE. Rotorua Statement: WAIORA: Promoting Planetary Health and Sustainable Development for All [Internet]. 2019 [cited 2021 November 29]. Available from: https://www.iuhpe.org/images/CONFERENCES/world/2019/Rotorua_statement_final.pdf

2. Steffen W, Grinevald J, Crutzen P, McNeill J. The Anthropocene: conceptual and historical perspectives. *Philos Trans A Math Phys Eng Sci*. 2011; 369: 842–867.
3. White L. The historical roots of our ecologic crisis. *Science*. 1967; 155: 1203–1207.
4. Kumar K. Modernization. *Encyclopedia Britannica* (n.d.) [cited 2014 March 10]. Available from: <http://www.britannica.com/EBchecked/topic/387301/modernization>
5. Whitmee S, Haines A, Beyrer C, Boltz F, Capon AG, de Souza Dias BF, et al. Safeguarding human health in the Anthropocene epoch: report of the Rockefeller Foundation–Lancet Commission on Planetary Health. *Lancet*. 2015; 386: 1973–2028.
6. Carey T. Time for other health professionals, systems to recognise harm to Indigenous peoples? [Internet]. Croakey, 2020 April 20 [cited 2021 January 18]. Available from: <https://www.croakey.org/time-for-other-health-professionals-systems-to-recognise-harm-to-indigenous-peoples/>
7. Caldwell L, Grobbel C. The importance of reflective practice in nursing. *Int J Caring Sci*. 2013; 6: 319–326.
8. United Nations. United Nations Declaration on the Rights of Indigenous Peoples [Internet]. Resolution adopted by the United Nations General Assembly, 13 September 2007 (A/RES/61/295) [cited 2021 November 29]. Available from: https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf
9. Guterres A. The State of the Planet (UN Secretary-General's address at Columbia University [Internet], 2 December 2020). [cited 2021 March 13]. Available from: <https://www.un.org/sg/en/content/sg/statement/2020-12-02/secretary-generals-address-columbia-university-the-state-of-the-planet-scroll-down-for-language-versions>
10. Guterres A. Foreword. In: United Nations Environment Programme. *Making Peace with Nature: A scientific blueprint to tackle the climate, biodiversity and pollution emergencies* [Internet]. Nairobi. 2021. Available from: <https://www.unep.org/resources/making-peace-nature>
11. Cornthassel J. Re-envisioning resurgence: Indigenous pathways to decolonization and sustainable self-determination. *Decolonization Indigeneity Educ Soc*. 2012; 1: 86–101.
12. Ngata T. *Kia Mau: Resisting Colonial Fictions*. Wellington: Kia Mau Campaign, 2019.
13. Moewaka Barnes H, McCreanor T. Colonisation, hauora and whenua in Aotearoa. *J R Soc N Z*. 2019; 49(Suppl 1): 19–33.
14. Redvers N. The determinants of planetary health. *Lancet Planet Health*. 2021; 5: e111–e112.
15. Steffen W, Broadgate W, Deutsch L, Gaffney O, Ludwig C. The trajectory of the Anthropocene: the great acceleration. *Anthropocene Rev*. 2015; 2: 81–98.
16. Canadian Public Health Association. *The Ecological Determinants of Health* [Internet]. Ottawa: CPHA, 2015 [cited 2021 November 29]. Available from:

- https://www.cpha.ca/sites/default/files/assets/policy/edh-discussion_e.pdf
17. Lenton T, Rockström J, Gaffney O, Rahmstorf S, Richardson K, Steffen W, et al. Climate tipping points – too risky to bet against. *Nature*. 2019; 575: 592–595.
 18. Our World in Data [Internet]. Life expectancy, 1770 to 2018 [cited 2021 March 11]. Available from: https://ourworldindata.org/grapher/life-expectancy?t=ab=chart&time=1770..2018&country=~OWID_WRL®ion=World
 19. UN Environment. Global Environment Outlook – GEO-6: Healthy Planet, Healthy People. Nairobi, Kenya: UNEP; 2019.
 20. IUHPE & Health Promotion Forum of New Zealand. Waiora – Indigenous Peoples’ Statement for Planetary Health and Sustainable Development [Internet]. 2019 [cited 2021 November 29]. Available from: https://www.iuhpe.org/images/CONFERENCES/world/2019/Indigenous_People_statement_final.pdf
 21. World Bank. Our People, Our Resources: Striving for a Peaceful and Plentiful Planet [Internet]. 2015 [cited 2021 February 14]. Available from: <https://openknowledge.worldbank.org/handle/10986/22972>
 22. Tu’itahi S, Lima I. Pacific health promotion. In: Signal L, Ratima M (eds). *Promoting Health in Aotearoa New Zealand*. Dunedin, New Zealand: Otago University Press, 2015; pp.64–81.
 23. Durie M. An Indigenous model of health promotion. *Health Promot J Austr*. 2004; 15: 181–185.
 24. UN Department of Social and Economic Development Affairs. Traditional knowledge – an answer to the most pressing global problems? [Internet]. New York, USA. 2019 [cited 2021 February 15]. Available from: <https://www.un.org/development/desa/en/news/social/permanent-forum-on-indigenous-issues-2019.html>
 25. World Bank. Indigenous Peoples Overview [Internet]. 2021 [cited 2021 February 14]. Available from: <https://www.worldbank.org/en/topic/indigenous-peoples#1>
 26. Kawharu M. Kaitiakitanga: a Maori anthropological perspective of the Maori socio-environmental ethic of resource management. *J Polyn Soc*. 2000; 109: 349–370.
 27. Yates A. On whenua, landscape and monumental interiors. *idea J*. 2006; 7: 103–113.
 28. Ratima M, Martin D, Castleden H, Delormier T. Indigenous voices and knowledge systems – promoting planetary health, health equity, and sustainable development now and for future generations. *Glob Health Promot*. 2019; 26(Suppl 3): 3–5.
 29. Redvers N, Schultz C, Vera Prince M, Cunningham M, Jones R, Blondin BS. Indigenous perspectives on education for sustainable healthcare. *Med Teach*. 2020; 42: 1085–1090.
 30. Baha’i Quotations on Environment and Sustainable Development [Internet]. (Letter written on behalf of Shoghi Effendi, 17 February 1933, Compilation on Social and Economic Development, p. 4). International Environment Forum 2020 [cited 2021 November 29]. Available from: https://iefworld.org/cmpquotes.htm#Bahai_attitude_towards_nature
 31. McNeill HN. Māori and the natural environment from an occupational justice perspective. *J Occup Sci*. 2017; 24: 19–28.
 32. Cobb M, Puchalski C, Rumbold B (eds). *The Oxford Textbook of Spirituality in Healthcare*. Oxford: Oxford University Press; 2012.
 33. Oman D. Why Religion and Spirituality Matter for Public Health: Evidence, Implications, and Resources. Cham, Switzerland: Springer; 2018.
 34. Salander P. Whether ‘spirituality’ can be a meaningful concept is still open to question. *Palliat Support Care*. 2015; 13: 101–102.
 35. Puchalski CM, Vitillo R, Hull SK, Reller N. Improving the spiritual dimension of whole person care: reaching national and international consensus. *J Palliat Med*. 2014; 17: 642–656.
 36. Bangkok Charter. The Bangkok charter for health promotion in a globalized world. *Health Promot Int*. 2006; 21(Suppl 1): 10–14.
 37. Saunders C. The evolution of palliative care. *Patient Educ Couns*. 2000; 41: 7–13.
 38. Mercadante L. Spiritual struggles of nones and ‘spiritual but not religious’ (SBNRs). *Religions*. 2020; 11: 513.
 39. Pew Research Centre. The changing global religious landscape [Internet]. 2017 [cited 2021 November 29]. Available from: <https://www.pewforum.org/2017/04/05/the-changing-global-religious-landscape/>
 40. Egri CP. Spiritual connections with the natural environment: pathways for global change. *Organ Environ*. 1997; 10: 407–431.
 41. Kamitsis I, Francis AJ. Spirituality mediates the relationship between engagement with nature and psychological wellbeing. *J Environ Psychol*. 2013; 36: 136–143.
 42. Pritchard A, Richardson M, Sheffield D, McEwan K. The relationship between nature connectedness and eudaimonic well-being: a meta-analysis. *J Happiness Stud*. 2020; 21: 1145–1167.
 43. Shakespeare M, Fisher M, Mackean T, Wilson R. Theories of Indigenous and non-Indigenous wellbeing in Australian health policies. *Health Promot Int*. 2021; 36: 669–679.
 44. Ives CD, Kidwell J. Religion and social values for sustainability. *Sustain Sci*. 2019; 14: 1355–1362.
 45. Bluck JL. *Long, White & Cloudy: In Search of a Kiwi Spirituality*. Christchurch, New Zealand: Hazard Press; 1998.
 46. Taylor C. *A Secular Age*. Cambridge, MA: Belknap Press of Harvard University Press; 2007.
 47. King U. Can spirituality transform our world? *J Study Spiritual*. 2011; 1: 17–34.
 48. Bomberg E, Hague A. Faith-based climate action in Christian congregations: mobilisation and spiritual resources. *Local Environ*. 2018; 23: 582–596.
 49. Mickey S. Spiritual ecology: on the way to ecological existentialism. *Religions*. 2020; 11: 580.

50. Molino J. Engaging Pope Francis' *Laudato Si* in the discourse on environmental communication. *Relig Soc Commun.* 2018; 2018: 51–71.
51. Bahá'í International Community. Valuing Spirituality in Development: Initial Considerations Regarding the Creation of Spiritually Based Indicators for Development. A concept paper written for the World Faiths and Development Dialogue, Lambeth Palace, London, 18–19 February 1998; Bahá'í Publishing Trust, London.
52. Chapin FS, Power ME, Pickett ST, Freitag A, Reynolds JA, Jackson RB, et al. Earth Stewardship: science for action to sustain the human-earth system. *Ecosphere.* 2011; 2: 1–20.
53. King U. *The Search for Spirituality: Our Global Quest for a Spiritual Life.* New York, NY: Bluebridge Books; 2011.
54. Health Promotion Forum. *Nga Kaiakatanga Hauora mo Aotearoa / Health Promotion Competencies for Aotearoa-New Zealand.* Auckland, New Zealand: Health Promotion Forum; 2000.
55. Gerhardt-Strachan K. Exploring the place of spirituality in Canadian health promotion. *Health Promot Int.* Epub ahead of print 23 February 2021. DOI: 10.1093/heapro/daab027.
56. Escobar A. Healing the web of life: on the meaning of environmental and health equity. *Int J Public Health.* 2019; 64: 3–4.
57. WHO. *The Ottawa Charter for Health Promotion.* Copenhagen, Denmark: WHO Europe; 1986.
58. Hancock T. Population health promotion 2.0: an eco-social approach to public health in the Anthropocene. *Can J Public Health.* 2015; 106: e252–e255.
59. Parkes MW, Poland B, Allison S, Cole D, Culbert I, Gislason MK, et al. Preparing for the future of public health: the ecological determinants of health and the call for an eco-social approach to public health education. *Can J Public Health.* 2019; 111: 60–64.
60. Hancock T. It's the environment, stupid! Declining ecosystem health is THE threat to health in the 21st century. *Health Promot Int.* 2011; 26: ii168–ii172.
61. Horwitz P, Parkes MW. Intertwined strands for ecology in planetary health. *Challenges.* 2019; 10: 20.
62. Parkes MW, Horwitz P. Water, ecology and health: ecosystems as settings for promoting health and sustainability. *Health Promot Int.* 2009; 24: 94–102.
63. Martin D. Indigenous knowledge is the solution to Canada's health inequities. *The Conversation,* 2018 November 28 [Internet]. [cited 2021 November 29]. Available from: <https://theconversation.com/indigenous-knowledge-is-the-solution-to-canadas-health-inequities-106226>
64. Poland BD, Dooris M. A green and healthy future: the settings approach to building health, equity and sustainability. *Crit Public Health.* 2010; 20: 281–298. Available from: <http://simplelink.library.utoronto.ca/url.cfm/224850>
65. Northern Health. *Position on the Environment as a Context for Health: An Integrated Settings Approach* [Internet]. Prince George, BC: Northern Health; 2012 [cited 2021 November 29]. Available from: https://www.northernhealth.ca/sites/northern_health/files/about-us/position-statements/documents/environment-context-health-full.pdf
66. Maller C, Townsend M, St Leger L, Henderson-Wilson C, Pryor A, Prosser L, et al. Healthy parks, healthy people: the health benefits of contact with nature in a park context. A review of relevant literature. *George Wright Forum.* 2009; 26: 51–83.
67. Gislason MK, Morgan VS, Mitchell-Foster K, Parkes MW. Voices from the landscape: storytelling as emergent counter-narratives and collective action from northern BC watersheds. *Health Place.* 2018; 54: 191–199.
68. Jenkins A, Horwitz P, Arabena K. My island home: place-based integration of conservation and public health in Oceania. *Environ Conserv.* 2018; 45: 125–136.
69. Capon AG, Dixon JM. Creating healthy, just and eco-sensitive cities. *N S W Public Health Bull.* 2007; 18: 37–40.
70. Hancock T, Desai P, Patrick R. Tools for creating a future of healthy One Planet cities in the Anthropocene. *Cities Health.* 2020; 4: 180–192.