

The Interconnectedness of People and Planet

LEARNING FROM MĀORI WORLDVIEWS

This anthology is a project of the Planetary Health Alliance (planetaryhealthalliance.org). The Planetary Health Alliance is a consortium of over 200 partners from around the world committed to understanding and addressing the human health impacts of global environmental change.

Case studies were written and photographed by Hilary Duff with editing and support from Amalia Almada, Christopher Golden, and Sam Myers. Teaching guides were written by Carlos A. Faerron Guzmán.

Please cite this case study as “Duff H., Faerron Guzmán, C., Almada, A., Golden, C., and Myers, S. “The Interconnectedness of People and Planet: Learning from Māori Worldviews.” Planetary Health Case Studies: An Anthology of Solutions. 2020; https://doi.org/10.5822/phanth9678_10”

Please note this work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view a copy of the license, visit <https://creativecommons.org/licenses/by-nc-nd/4.0/>

To access the full Planetary Health Case Studies: An Anthology of Solutions, please visit <https://www.planetaryhealthalliance.org/case-studies>



Executive Summary

This case study addresses issues of traditional knowledge, connection to place and mental health which are also explored in chapters 9 and 18 of [Planetary Health: Protecting Nature to Protect Ourselves](#).

ⁱ As noted by Dr. Fiona Cram et al in a 2019 [report](#) on Māori health inequities, the terminology used to describe health and well-being and the act of achieving it has changed over time. *Hauora* is one term currently in use, as are *waiora*, *rapuora*, and *whakaoranga*.

Learning Objectives

After examining this case, students should be able to:

- ① Recognize the existence of diverse worldviews and cultures, including one's cultural values, identities, and assumptions, and their effect on the understanding of others in the context of planetary health.
- ② Compare and contrast how Indigenous worldviews and traditional knowledge systems differ from dominant western thoughtⁱⁱ concerning the relationship to the natural environment.
- ③ Describe how Indigenous worldviews and lived experiences determine the extent of the consequences of anthropogenic environmental change.
- ④ Apply intercultural principles and Indigenous knowledge appropriately to health-related actions, projects, programs, and policies.

ⁱⁱ Although a contentious term, for the lack of a better word, we use western thought to describe the post-colonial dominant worldviews imposed throughout many part of of the world mainly by European colonials and settlers.

Many Indigenous perspectives on health and well-being are well aligned with the emerging field of planetary health. In Aotearoa New Zealand, the Indigenous Māori population has long understood the interconnectedness between the natural environment and human health and well-being. This is reflected in Māori worldviews and their conceptualization of health and well-being: *hauora*.ⁱ *Hauora* values a number of dimensions, including the emotional, mental, social, and spiritual well-being of families. It also articulates the fluidity that exists within the Māori sense of identity: that an individual's personhood hinges not only on one's physical health, but also on the well-being and protection of their community and the natural world.

Despite this deep understanding of the integrated nature of human health and a flourishing natural environment, Māori and Indigenous people worldwide are among the groups most vulnerable to environmental change. These changes exacerbate the ongoing effects of colonialism, and the destruction of the natural world has significant implications on the physical, mental, and spiritual well-being of Māori tribes.

The New Zealand government has made some progress in recognizing and modeling Māori worldviews of health and well-being in its healthcare and natural resource policies—though many shortcomings remain. This case reiterates the importance of meaningful relationship-building and partnership in order to learn from Indigenous ways of knowing to strengthen our ability to address the unique challenges faced in the Anthropocene.

This case study was drafted based on interviews conducted in Aotearoa New Zealand in July and August 2019. It was reviewed by Gabrielle Baker (Ngāpuhi) in September 2019.

A Note on Language

This case study uses the te reo Māori terms for Māori concepts. Te reo Māori, which translates to “the Māori language,” is an official language of New Zealand. Around 55% of Māori adults have some ability to speak te reo Māori,¹ and the language is increasingly used in official government documents and in the media.

While it’s difficult to directly translate concepts to definitions, this case study draws from the explanations received by the case study author and confirmed by the case study reviewer. Te reo Māori proficiency is one of the measures used to gauge a person’s cultural well-being.² The te reo Māori name for New Zealand, Aotearoa, is also used in this case. Both describe the island country. Finally, this case indicates *iwi* (tribe) affiliations. *Iwi* identities are listed in parentheses after the first mention of a person’s name.

We encourage readers to visit the [Māori Dictionary website](#), where you can find definitions and audio pronunciations (linked below). The New Zealand Ministry of Education has also developed a helpful [pronunciation guide](#).

Glossary

Aotearoa ([pronunciation](#)) - the te reo name for New Zealand.

Hapū ([pronunciation](#)) - a clan or subtribe that is part of a larger *iwi* and made up of a number of *whānau* groups.

Hauora ([pronunciation](#)) - a Māori term for health or vigor. Typically includes four pillars: physical well-being, mental and emotional well-being (self confidence), social well-being (self esteem), spiritual well-being (personal beliefs).

Iwi ([pronunciation](#)) - people or nation. Iwi are the largest partition of Māori society and often compose several *hapū* which then include *whānau*.

Kaitiakitanga ([pronunciation](#)) - the Māori concept of guardianship or stewardship.

Karakia ([pronunciation](#)) - a prayer or blessing.

Kaumātua ([pronunciation](#)) - a respectful term used for older folks.

Kaupapa ([pronunciation](#)) - a theme or topic for discussion.

Mana ([pronunciation](#)) - a sense of authority, control, or power; a sense of “awesome.”

Māori ([pronunciation](#)) - Indigenous person of Aotearoa. The original inhabitants of New Zealand.

Maramataka ([pronunciation](#)) - Māori calendar based on the cycles of the moon.

Marae ([pronunciation](#)) - the courtyard of a Māori meeting house, often used for ceremonies and meetings; a significant place in Māori culture.

Mātauranga ([pronunciation](#)) - the body of traditional and contemporary knowledge about the world—both physical and spiritual—held by Māori. It also involves ways of knowing.

Mirimiri ([pronunciation](#)) - a massage; considered a *rongoā* treatment.

Rongoā ([pronunciation](#)) - any medicine, drug, or treatment; not always physical in nature.

Taonga ([pronunciation](#)) - a treasured item (physical or non-physical).

Te Tiriti o Waitangi (*tay tear-ee-tea oh wah-tan-gi*) - the treaty signed in 1840 by North Island *iwi* chiefs and the British Crown.

Tikanga ([pronunciation](#)) - a procedure or custom.

Utu ([pronunciation](#)) - the Māori concept of reciprocity.

Whakapapa ([pronunciation](#)) - to place in layers, to establish genealogy and ancestry not only with other human beings but among other species, too.

Whakawhanaungatanga ([pronunciation](#)) - the process of establishing relationships and relating to others.

Whānau ([pronunciation](#)) - extended family including multiple generations; the smallest partition of Māori society.

Whenua ([pronunciation](#)) - land, placenta, afterbirth.

Introduction

ⁱⁱⁱ A marae is a traditional gathering place and a sacred focal point of Māori society.

Standing next to a strip of overturned soil, Hone Moetara (Ngāpuhi) envisions the future. The strip of land is a couple hundred meters long, bordered on one side by the Paparoa Maraeⁱⁱⁱ and a train track on the other. Every so often the peace of the rainy drizzle is disrupted by the rattle of a timber-filled train heading to the nearby port, a fitting illustration of the juxtaposition between Māori tradition and contemporary society.

This is the place where Moetara plans to construct a garden filled with plants and trees native to Aotearoa. He intends to use the land as a teaching tool, ensuring that *rongoā rākau* practices—the creation of remedies, medications, and tonics derived from nature—can continue and be passed on to subsequent generations. This land is in Te Puna, a rural community near the eastern coast of the country’s North Island.

Today, only a few native plants fringe the soon-to-be garden. Moetara points them out. There’s the tall *tī kōuka* (cabbage tree) whose palm can serve as a food source. The bark of the *houhere* plant is used to make hats and handkerchiefs, and is effective at coaxing phlegm from the lungs. Then there’s the heart-shaped leaves of the *kawakawa* plant, a multipurpose healer commonly used as a blood thinner, diuretic, and to open the respiratory system. Externally, it’s turned into a salve that can be applied to abscesses and other wounds.

↘ [Video: Hone Moetara introduces the kawakawa plant.](#)

For Moetara, a *rongoā* practitioner at the nearby Pirirakau Hauora health center, these plants are nature’s medicine cabinet. “You have to stand back and look at the horizon of what’s growing where,” describes Moetara of the plants and their healing properties. “If the land has been scarred, the plants that come up first are the ones you use when you scar your body. The plants growing in wet areas are the plants you use for fungal infections and athlete’s foot. It’s relating the land back to the body and the plants that are growing in those areas. We forget that. We just go to the doctor and they give us a tube of stuff.” Moetara’s *Rongoā* Planting Project is meant to recognize the many opportunities that nature presents for learning, whether it be lessons related to mental health, human biology, spirituality, ecology, and more.

A range of practices constitute *rongoā*, including the *rongoā* rākau plant remedies and *mirimiri* (massage). Sometimes these practices treat a physical malady, such as the symptoms Moetara mentioned earlier. But he and others are quick to add that the practice of *rongoā* is more than a jumble of leaves boiled in water. *Rongoā* practices are about treating a whole person, identifying the emotional, mental, community, or spiritual problems that may be manifesting in the form of physical illness.^{iv}

^{iv} In western societies, these practices are sometimes referred to as integrative or holistic.



This is the land that will soon become the *rongoā* rākau garden. A teaching tool for the community, Moetara says the *Rongoā* Planting Project will also help improve health, social, and environmental outcomes for the Pirirakau Hauora health center, the Pirirakau hapu (sub-tribe), and the wider community.

“There is intention in *rongoā*, it’s the love behind it,” adds Moetara. “It’s reading the person and asking how this is going to suit what is going on in them.” For example, is it best to pick from a young plant for an elderly person? Should the leaves of a female tree be harvested for a male patient? When it comes time to harvest, *karakia* is essential. Often translated to mean prayer, Moetara says *karakia* is more about mindfulness and the setting of intention—engaging with the bush before you step into it. “It’s about paying respect to Mother Earth by saying thanks before you cut anything down,” he explains. *Rongoā* can also be conversation, laughter, time spent in nature, bringing family members together—anything that makes a person feel well.

The healing properties of community and nature are two dimensions underpinning the way in which Māori and Indigenous cultures worldwide view health and well-being. Contemporary Western culture commonly views people and planet as separate

v Where in history does western thought emerge? At which points in the last 400 hundred years was this idea of people and planet being separate strengthened?

pillars, with one's sense of identity firmly pinned to their individual actions.^v Māori and Indigenous cultures worldwide, however, take a broader view. For Māori, a sense of identity extends beyond the individual to include the community and their ancestral land—a recognition of the essential fluidity between human health, well-being, and protection of the natural world. These dimensions cannot exist in isolation.

This interconnectedness is an illustration of *utu*, the principle of reciprocity—a recognition that people need to value the resources the land provides. Said one stakeholder in a report on *rongoā* Māori: “There is reciprocity between man and the environment. When the language of the country is sung or chanted, the plant is revived, the land replenished. The heart, head, spirit, there is no separation, all is related, whole.”^{3vi}

vi What are other cultures that are similar to the Māori, at least broadly, in their worldviews?

Kaupapa Māori: The Aspirations and Philosophy of Community

One in seven people living in New Zealand identify as Māori—16.5% of the country's population of 4.7 million.⁴ The country's Indigenous people have been broadly categorized as “Māori” since European settlers first came to New Zealand, and this single ethnic grouping continues today.^{vii} However, many criticize this broad, all-encompassing category of Māori. “Māori is non-existent,” says researcher Apanui Skipper (Ngāti Tamaterā, Ngāti Raukawa). “Our knowledge would always be held by different *iwi*. People identify by *iwi*, not as Māori.”

vii This would be the equivalent of a foreign nation colonizing the whole American continent today and classifying us under one same culture.

Apanui Skipper in what is today known as Thames. Behind him is the sacred mountain for his *iwi*.



iwi is the name for the largest social unit of Māori society, and they are the independent nations or tribes that make up New Zealand. According to most recent census data, 85% of Māori identify as belonging to one of 10 large tribes, though it's estimated that there are more than 70 across New Zealand.⁵ A single *iwi* is made up of several *hapū*—clans or sub-tribes within the larger *iwi*. *Whānau* is the smallest entity in Māori society. Not a nuclear family of two parents and their children, *whānau* are extended, multigenerational family groups.^{viii}

Viewing *whānau* as the smallest partition of society is significant. It speaks to the value of decision making that places collective needs over individual wants. “[This generational element of relationships] causes us to always think about the future. Our children and grandchildren will reap the benefits of what we invest today in terms of energy, well-being, and prosperity,” explains Reweti Te Mete (Ngāi Te Rangī), a project manager with Ngā Mataapuna Oranga, a Māori primary health organization. Considering the broader implications of one's actions governs the relationships Māori have with each other and with the environment.

The multigenerational, collective worldviews held by Māori and other Indigenous groups worldwide are a key difference between Indigenous and contemporary Western cultures. Another difference is the way in which Indigenous peoples perceive the Earth and are affected by environmental loss.^{ix}

viii How are “social units” organized in your culture? How long has this been this way? What elements (celebrations, holidays, beliefs, etc.) of your culture strengthen these social units?

ix Before moving forward, what do you think are some of these key differences? What are some similarities? Has this changed recently?



The Kauri tree is symbolic in Māori culture. It represents Tāne Mahuta (pictured), the Māori God of the Forest. Kauri dieback disease, caused by a mold, has been killing Kauri trees across New Zealand for the past half century. Photo via Flickr user itravelNZ.

“Environmental change means a lot for Indigenous cultures because we’re the ones who feel the impact first as the caretakers of the environment, even when the land is taken away from us [i.e. through colonization],” says Hone Moetara, the *rongoā* practitioner. “We’re the ones reading the weather patterns, what the oceans are telling us.” Moetara references the dying kauri trees in New Zealand, explaining it’s a sign that Mother Nature isn’t happy. “When you talk to other Indigenous cultures their signs are the same. The Earth is being used as a commodity and it’s a question of how do we go forward as Indigenous people to save our planet?”

Māori Views of Health and Well-being

Each Indigenous culture has its own creation story and set of behaviors governing the interactions between people and the natural world. Many, however, share similar guiding values.

One of those values is the recognition that an individual’s health, well-being, and sense of identity depends on blurred dimensions of physical, mental, social, and spiritual well-being. For Māori, protection and care for the land of one’s *iwi* is central to spiritual well-being. When combined, each of these dimensions leads to an outlook on health that goes beyond an assessment of a person’s physical state. This is consistent with the way in which the World Health Organization (WHO) defines health and well-being. “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity,” declares the preamble of the agency’s constitution.^{6x}

For Māori, *hauora* is one term to describe this outlook on health and well-being. *Hauora* literally translates to “the breath of life.” It’s one of the many teachings of *Mātauranga Māori*, the traditional and contemporary wisdom that has been developed and refined over the centuries in which Māori have lived in Aotearoa. It encompasses the empirical knowledge that has been gleaned from observing and knowing a natural environment, and a deep sense of belonging within it.

^x This definition was created in the post-WWII era. If you were to rewrite it today, would you define it differently? How?



Through the lens of *hauora*, a number of dimensions must be balanced in order for a person and their family to be considered well and strong.⁷ These dimensions are articulated through the many models of health and well-being that exist in New Zealand. Two of the most widely recognized are Te Whare Tapa Whā and Te Pae Mahutonga. These models have been articulated by Sir Mason Durie (Rangitāne, Ngāti Kauwhata, Ngāti Raukawa), one of the country’s most respected Māori health experts. A third model, Te *Wheke*, was conceptualized by revered *tohuna tipua* and keeper of wisdom, Dr. Rose Pere (Ngāi Tūhoe, Ngāti Ruapani, Ngāti Kahungunu). The three models share common values, and see an individual as part of a multigenerational interconnected system that includes the community and the natural world.

The underside of a silver fern, one of New Zealand’s most emblematic native plant species. Silver ferns hold much significance in Māori culture, and some iwi (tribes) would use them as trail markers, flipping the silver side upwards in order to note the correct path through the dark. Photo via Flickr user @cogdog.



Two Additional Models of Māori Health and Well-being

Two other models of Māori health and well-being are commonly referenced in addition to Te Pae Mahutonga: Te Whare Tapa Whā and Te Wheke. Both are explored below and are helpful in providing context around how Māori communities conceptualize *hauora*.

Te Whare Tapa Whā

In 1984, the Māori Women's Welfare League released a ground-breaking report, "Rapuora: Health and Māori Women." Rapuora discussed aspects of Māori health and well-being as involving interrelated physical, mental, spiritual and family (*whānau*) elements.⁸ From there, Sir Mason Durie conceptualized the model of health called Te Whare Tapa Whā. It takes the shape of a *whare* (house). Forming the walls of the house are *taha tinana*, *taha hinengaro*, *taha whānau*, and *tapa wairua*, representing 1) physical, 2) emotional and mental, 3) social, and 4) spiritual health.

Social health (*whānau*) acknowledges the importance of the collective health of an extended family, and includes the connection people have with their ancestors and future generations. Emotional and mental health (*hinengaro*) is the ability for people to think, to communicate, and to have the safety and security of knowing they belong in the world. The dimension of spiritual health (*wairua*) is the one most commonly excluded in mainstream models of care.⁹ Spiritual balance involves the well-being of a person's life force, referred to as their *mauri*, and a sense of belonging related to "who and what we are, where we have come from and where we are going."¹⁰

Te Wheke

Wheke means octopus in te reo Māori, and this model draws its inspiration from the animal's eight tentacles. In Te Wheke, the head of the octopus represents *iwi*, *hapū*, or *whānau*, the three levels of Māori society. The tentacles of the octopus are:

- Wairuatanga – spirituality;
- Hinengaro – the mind;
- Taha tinana – physical well-being;
- Whanaungatanga - extended family;
- Mauri – life force in people and objects;
- Mana ake – unique identity of individuals and family;
- Hā a koro ma, a kui ma – breath of life from forbearers;
- Whatumanawa – the open and healthy expression of emotion.¹¹

"The model proposes that sustenance is required for each tentacle/dimension if the organism is to attain *waiora* or total well-being," writes Dr. Catherine Love (Te Atiawa, Taranaki, Ngāti Ruanui, Nga Ruahinerangi) in a paper describing Te Wheke.¹² "The octopus can survive, but not function optimally, without the use of a tentacle."

Te Pae Mahutonga, Durie's health promotion model, is inspired by the te reo Māori name for the Southern Cross constellation. The constellation holds great significance in Māori culture. Just as the Southern Cross has four central stars, the Te Pae Mahutonga model outlines the four dimensions needed for people to have control over their own health and well-being. Durie expands on these concepts in a 1999 paper advocating for an Indigenous model of health promotion.¹³

The first dimension, *mauriora*, is about attaining a sense of cultural identity. This includes the security and means to access both physical and non-physical worlds, including traditional land, language, and cultural practices.

Next, *waiora* is the harmonizing of people with their natural world and the ability to protect it. "A central element of indigeneity is the close association between people and the natural environment—land, waterways, the air, beaches, harbors and the sea, native flora and fauna. Good health is compromised where there is atmospheric pollution, contaminated water supplies, smog, random mining activities, or commercial developments that exploit the land they cover," wrote Durie.¹⁴ He offers further comments on *waiora* in another paper¹⁵: "It is not simply a call for a return to nature, but an attempt to strike balance between development and environmental protection and recognition of the fact that the human condition is intimately connected to the wider domains of Rangi and Papa."^{xi}

Toiora is the third foundation of Te Pae Mahutonga, and is the ability for Māori to lead healthy lifestyles. This means having the agency to overcome some of the trappings of poverty and the built environments in which Māori often live: "the number of alcohol outlets per head of population, the number of fast food outlets per head of population, the traffic density on the road that goes past the school," explained Durie at the launch of He Korowai Oranga, the Māori Health Strategy.¹⁶ "Whether we're talking about the natural environment or manmade environments, we should remember that they are hugely important determinants of good health and a flourishing *mauri*."^{xii}

Finally, *te oranga* involves a person's participation in society. This includes the ability for Māori to not only access the goods and services provided by society, but also participate in the shaping of them. Durie notes that *te oranga* is generally not met, and that



Sir Mason Durie. Photo via Flickr user Simon Fraser University.

^{xi} In western thought, what concept resembles *waiora*?

In the Māori creation story, Rangi is the sky, and father of all things. Papa is the Earth, and the mother of all things.

^{xii} What does the idea of *mauri* resemble?

Mauri is loosely described as someone's life force or sense of 'awesomeness'

“Disparities between Indigenous and non-Indigenous populations are well documented and confirm gaps on almost every social indicator...” including health.¹⁷

Though Te Pae Mahutonga is an oft referred model of health and well-being, health leaders say there are limitations in thinking a single model can apply to all Māori. “Well-being is culture and practice. It’s being allowed to use our cultural models as we see fit, not other people’s cultural models,” explains Cindy Mokomoko (Te Rarawa, Te Arawa), Managing Director of Te Puna *Hauora* Ki Uta Ki Tai, a mental health and addiction services organization. “There are quite a few Māori models that have been written, but we don’t even want those imposed on us. We have our own experiences and our own connections to our land and environment.”

Hauora and *Mātauranga Māori* are highly place-based. Learning from these models requires an expanded understanding of Māori worldviews and values, and an exploration of the relationships people have with one another and the natural world.

A person’s *iwi* (tribal affiliation) is more than a casual classification of where they’re from—that place is central to Māori identity. This is apparent from the moment of introduction. In addition to identifying their tribe, people will also commonly share the land, river, and mountain from which their tribe draws its spiritual power or *mana*. Māori are *tangata whenua*, which means “people of the land.” The term *whenua* also means placenta, illustrating just how deeply the land is seen as a motherly source of life and part of one’s identity.¹⁸

The process of introducing oneself by place is called *whakawhanaungatanga*. The concept broadly translates to mean how you relate to someone. *Whakawhanaungatanga* is used to establish trust and belonging in traditional and contemporary Māori society. In the past, it was a process to prevent sabotage between warring tribes. Today, it’s a way of sharing how your values have been shaped by the place you’re from. People can see if those values are shared with others in the room, creating the grounds for relationship-building. *Whakawhanaungatanga* is also a way to express *whakapapa*—the genealogical connection people have with their ancestors and ancestral land, and a way to communicate

knowledge.¹⁹ Establishing *whakapapa* with someone new is a core value of Māori worldviews.



Māori Environmental Indicators

The sharing of *Mātauranga Māori* means tribes across the country have developed centuries of observation-based, empirical data to read the patterns of their local flora, fauna, and weather. Apanui Skipper is a researcher who has looked at how this traditional ecological knowledge can be used to predict natural hazards and their resulting health outcomes.

According to Skipper’s research, environmental indicators come in the form of *tohu*, signs in nature. An example of *tohu* is offered by the Pohutukawa, one of New Zealand’s most iconic trees. Around December, the Pohutukawa trees blossom with bright red bursts. “If it’s flowering from the bottom up, that’s a strong signal that it will be a dry summer,” explains Skipper. “In the middle of the year we also have the rising of Matariki (The Pleiades). The stars represent certain parts of our knowledge and we look to see if it will be a wet or dry summer. If [Matariki] is bright and clear and not hazy, we know it will be dry. This is one of our strongest signs.”

Skipper and his colleagues have also documented how *tohu* have been used to predict hazardous weather. For example, Ngāti Pare, an *iwi* in the northeast of the North Island say that if *kākā* parrots begin twisting and squawking above the forest then you know a storm is on its way. For the Ngāti Ruanui *iwi* in the southwest of the North Island, “the continuing cry of the *matuku* [bird] as it moves around at night” means floods are likely.²⁰ This traditional ecological knowledge offers an alternative source of weather information. The regular reading of these signs would inform how frugal people were with their water or food, when to prepare for a storm, or take other actions to adapt to the changing environment.

The Maramataka is another traditional tool Māori have to read the environment. Based on the lunar cycle and the stars, this Māori calendar can be used to make weather predictions on a monthly, daily, or seasonal basis. It can also inform when to best plant or harvest certain crops or animals—choices that have implications on human health.

Dr. Isaac Warbrick is an exercise physiologist who is looking at contemporary applications of the Maramataka as it relates to fitness and overall well-being for Māori families. “There were specific days around the full moon that were better for high energy activities, and there were certain days that were low energy where people would fix the fishing nets or talk in a lower voice,” explains Warbrick of past applications of the Maramataka. The Maramataka could be used equally so today, allowing people to be more in sync with the changes to their surrounding environment. “I think it’s a better way of managing our time and energies rather than this whole ‘wake up on Monday, work 9 to 5, and expect to do the same thing on Tuesday, Wednesday, and crash on the weekend,’” Warbrick says. “I don’t think [that schedule] aligns with any kind of natural environmental rhythm. It sounds kind of out there, but any scientist knows that animals and plants respond to different seasons or stages of the moon cycle. We’re the only living organism that tries to change our lifestyle while ignoring what’s going on in the environment.”

Worldviews Grounded in Place

There are examples of groups already applying the Maramataka to their activities. Warbrick notes a Māori group that trains for the Iron Man competition in the ocean during Tangaroa days [those associated with ocean-based activities], and runs and cycles in the forest during Tāne days [those associated with forest-based activities]. They also schedule race events on high energy days and recovery sessions on those that are low energy. In other instances, he gives the example of workplaces that schedule high intensity meetings on high energy days and offers employees a shortened day on low energy ones.

Though the Maramataka shifts based on place and year, Warbrick says the most important takeaway is that people reconnect with their ability to observe and to adapt: “I would think that a lot of our mental health and stress related issues are a result of us not aligning with these natural rhythms and being able to observe what’s going on in our body, family, and environment.”

Seeing *whakapapa* in practice is best illustrated by a few stories. In his office in the science department of the Auckland University of Technology, Dr. John Perrott (Te Arawa, Ngāti Pakeha), an expert in *Mātauranga Māori*, pulls a book off his shelf. Perrott is joined by Pete Edwards (Te Rarawa, Te Aupouri, Ngā Puhī), one of his PhD students. “Moa: The Life and Death of New Zealand’s Legendary Bird,” the cover reads. The Moa was a giant flightless bird endemic to New Zealand, one that went extinct with the first arrival of Māori to Aotearoa.²¹ The extinction of the Moa is still referenced as a reason why Māori cannot be responsible conservationists, but Perrott has an explanation for the behavior of his ancestors.



Dr. John Perrott and Pete Edwards at Auckland University of Technology.

“Moa was eradicated because Māori had no *whakapapa* to it. They didn’t see them as being relatives so they openly slaughtered them. Whakapapa is a restraining influence,” Perrott says. The connection established through *whakapapa* leads to *tikanga*, the custom and practice that governs the way you act around something. Because there was no *whakapapa*, there was no such protocol. Perrott says extinction of the Moa evolved Māori views of *whakapapa*, and continues to influence Māori-led environmental conservation to this day.

Another story illustrating the importance of *whakapapa*—and the role it can play in having natural resources legally protected—is that of the Whanganui River. There’s a well-known Māori proverb: *Ko au te awa. Ko te awa ko au.* “The river is me, I am the river.”²² This proverb is used by the tribe whose traditional land lies along the Whanganui River on Aotearoa’s North Island. It speaks to the connection Māori feel to that river, and how they consider it as part of their identity. Local tribes *whakapapa* to that river and consider it one of their own ancestors, just as someone would their human descendants.



The Whanganui River (Photo via Wikimedia Commons).

The Pohutukawa tree commonly features into Māori environmental indicators or tohu (signs).



Rivers are of particular significance to Māori culture. “Before people die, we ask someone to go back to the place where that person is from to get water from the stream so they can drink it,” says Apanui Skipper. “It might sound simple but it’s a pretty powerful illustration of the connection we feel to that land.”

In 2017, the Whanganui River became the first river worldwide to gain legal personhood,^{xiii} meaning it now has the same human rights as a person.²³ The legislation was passed by the New Zealand Parliament and represented a legal settlement to a series of historical claims that were first filed in the 1870s.²⁴ This isn’t the first or last instance of natural resources in New Zealand gaining personhood.²⁵ In 2014, Te Urewera, a large forested area, also gained environmental personhood. And six months after the Whanganui River gained legal rights, the same status was recognized for Mount Taranaki, a sacred mountain for several *iwi*.²⁶ Environmental personhood means that if the forest, river, or mountain is harmed, there are legal repercussions just as there would be if the act were committed against a human.^{xiv}

^{xiii} The notion of giving non-human entities intrinsic rights or “personhood” is explored in Chapter 17 on ethics of \ Planetary Health: Protecting Nature to Protect Ourselves.

^{xiv} What other countries has provided personhood to environmental elements? What implications does this have for conservationists around the world?



Environmental Personhood - Where and to What Effect?

New Zealand isn’t the only place where natural landscapes have been recognized as “persona”. Shortly after the Whanganui River was granted personhood, the same legal rights were bestowed on the Ganges river in India in an attempt to curb pollution.²⁷ The Ganges is a sacred body of water for more than a billion people. A Lake Erie Bill of Rights was established after a vote by residents in Toledo, Ohio in 2019.²⁸ In July 2019, Bangladesh took environmental personhood further even still, declaring that all rivers in the country had legal rights.²⁹

But what exactly is the process for people to, as guardians, claim legal rights on behalf of a landscape? And are those rights legally binding? Colombia presents a promising case. The South American country has recognized a number of rivers and its portion of the Amazon rainforest ecosystem as legal persons. The recognitions have led to the stoppage of mining activity along various rivers. And Ecuador became the first country to successfully uphold the legal rights of nature when a provincial government ruled that the Vilcabamba River was under threat by a road widening project. The ruling meant that areas of the river had to be rehabilitated and remediated in order to protect the environment for this generation and those of the future.³⁰

The concept of environmental personhood is nascent, and it will take further court rulings to prove whether the granting of legal rights to landscapes goes beyond the symbolic.

One final illustration of *whakapapa* and traditional ecological knowledge relates to the sprightly *hihi* (stitchbird).^{xv} The bird is named after the first rays of sun—*hihi*. In Māori culture, these sun rays are healing. “In this country our birds do a dawn chorus, and the *hihi* bird is one of them. They come from the darkness of the forest, go to the canopy, expose themselves to the sun, and ruffle their feathers,” shares John Perrott. “Light comes through the gaps in the canopy and you see flashes of yellow light: the *hihi* flying through the beams and capturing the healing rays of the sun. During the day it flies through the forest spreading its medicine. Healers learned from these birds, created a *whakapapa* to that, and then started using them as a way of learning about the forest. Because they were the most sensitive to the conditions of the forest, *hihi* were the first to go when it was disturbed. Māori learned very early that *hihi* were indicators of forest health and as a result, human health.”



^{xv} In this example, environmental indicators are defined as generational knowledge that has been developed through observations of the natural environment and how its changes affect ecosystem and human health. For Māori *iwi*, many of these measures are connected to birds. Pre-human contact, birds represented nearly all of the fauna found in New Zealand. They had few predators—only bats and a few other aerial birds. Due to this lack of land-based predators, many birds evolved to be flightless. The introduction of invasive species like rats had a large impact on ground-dwelling birds. As a result, many native birds have become locally extinct, including the *hihi* which is today found only in a few island bird reserves.

The yellow plumage of a male *hihi* (stitchbird) at Tiritiri Matangi, one of New Zealand’s bird reserves. The island reserve is one of the only places in the country where you can find the *hihi*. It was driven to local extinction on the mainland due to introduced species like rats. Today, the vulnerable species has been introduced to a few islands off the mainland, though the population remains unstable.

While *whakapapa* may sound abstract or spiritual, Perrott explains this knowledge has been developed from empirical observations passed from one generation to the next.

The Environmental and Health Impact of Belonging

“You’ve got to have *whakapapa* because without that you don’t have belonging and you lose your sense of something bigger,” contextualizes Pete Edwards, Perrott’s PhD student. “You then [take the environment] for granted and treat it as a commodity.”

Edwards is talking about the connection and care people must have with the land around them. He studies *kaitiakitanga*, the Māori concept of guardianship and protection of the environment and other *taonga* (treasures). He and Perrott are researching how customary *tikanga* (practice/custom) relating to the harvest of native birds could inform mainstream conservation and wildlife management policies. Not only does the research project aim to stem the decline of biodiversity, but it also aims to slow the loss of *Mātauranga* due to the passing of *kaumātua* (elders) who held this knowledge.

The late Reverend Maori Marsden, a self-described “writer, healer, minister, and philosopher” of Māori worldviews, wrote extensively about the importance of environmental belonging among Indigenous cultures. In his book, “The Woven Universe,” Marsden references a quote from Dr. Ranginui Walker, a Māori-Lebanese academic. It compares Indigenous worldviews to that of what he calls “metropolitan culture”—the dominating worldview of the west:

“[Indigenous cultures] think of themselves as holding a special relationship to Mother Earth and her resources; as an integral part of the natural order; recipients of her bounty rather than controllers and exploiters of their environment. Therefore Mother Earth is to be treated with reverence, love and responsibility rather than abuse and misuse.”

“How you perceive nature affects how you interact with it, and how you interact with it impacts your health,” says John Perrott. “Whakapapa is the starting point to personification, and this concept of seeing things [in nature] as familiar.”

Whakapapa also has a direct influence on mental health. “My background is the ocean. I studied marine science, but personally I’ve grown up next to the sea. The sea is me and I am the sea,” volunteers Pete Edwards as an example of this connection. “When my *mauri* (life force or sense of ‘awesomeness’) is not feeling the best, I jump in the sea with Tangaroa [the Māori God of the Sea]

and I know his children are there. They’re my relations, and that makes me feel better.”

Environmental Change and Mental Health^{xvi}

^{xvi} For further discussion of this term and other associated terms and more general discussion of the mental health burdens associated with environmental change, see Chapter 9 on Mental Health in [Planetary Health: Protecting Nature to Protect Ourselves](#)

^{xvii} Although *whakapapa* seems like a foreign concept, we all feel deep connections with our natural and built environment whether we realize it or not. What is a place you would feel specially concerned about losing? Think of why you chose this place, and what cultural elements define this importance.

When one’s mental health and sense of identity hinge so heavily on connecting with familiar lands and waters, what happens when those environments change or are lost? This is the question being asked today by scientists and clinicians alike—and is the unfortunate reality facing Māori and many Indigenous communities.

No culture, community, or country is immune to the impacts of environmental change—but these challenges are magnified for certain groups. Due to the *whakapapa* Māori and other Indigenous peoples have with their land, they are particularly affected by disruptions to those places. Worldwide, Māori and other Indigenous groups are some of the most vulnerable to the effects of climate change.³¹ Those vulnerabilities can affect people’s physical health, but also their mental health and sense of identity. ^{xvii}

“Climate change is a threat multiplier [for Indigenous communities],” says Dr. Rhys Jones (Ngāti Kahungunu), a public health physician and co-convenor of OraTaiao, the New Zealand Climate and Health Council. “Māori tend to be at higher risk of any health impact as a result of social and economic deprivation and marginalization. So as a pretty general statement, anything that has an impact on health will tend to disproportionately impact Māori communities.”

Jones and his co-authors articulate the effects of climate change on physical and mental well-being in a 2014 paper. Drought, extreme weather conditions, climate change-related migration, and loss of culturally significant sites will compound already higher-than-average mental health rates and suicidal behavior by Māori.³² Additionally, trauma from extreme weather events can be particularly impactful for remote and rural Māori communities. Finally, food and water contamination will make it more challenging for *iwi* tribes to access, consume, and share culturally-relevant foods. This list of negative implications is not exhaustive.



How Climate Change Mitigation Strategies Can Deepen Health Disparities

Mitigation efforts meant to lessen the effects of climate change can exacerbate health disparities among Māori and Indigenous communities.³³ “If our sole focus is to reduce greenhouse gas emissions then maybe putting wind turbines wherever makes sense, even if it’s on traditional land,” offers Dr. Rhys Jones as one example of a decision that could harm people’s spiritual health.

Another example was the introduction of a regional fuel tax in Auckland, New Zealand’s largest city, with revenues intended to mitigate climate change by improving public transit. “The more progressive people were quite keen on the idea but many warned of the regressive impacts,” counters Jones. “This particularly applies to Māori and Pacific communities where people don’t live in areas that are well served by public transit, or do shift work when transit services aren’t running. They’re more car dependent out of necessity.” As a result, the fuel tax could further stress the socio-economic situation of Māori, with lessened opportunity for them to take advantage of the benefits.

Mitigation strategies aside, Jones says climate change, racism, and colonization are inextricably intertwined: “Climate change amplifies existing threats to health and human rights, and climate change itself is intimately linked to colonialism. Colonialism is at the root of the global economic system that fuels anthropogenic climate change and is responsible for the social conditions that limit Indigenous peoples’ resilience and adaptation capacity. It is not possible to understand or address the effects of climate change for Indigenous health without acknowledging and confronting colonization.”³⁴

As a result of this history and the possibility of exacerbated harm, the onus is on policymakers to identify the potential unintended consequences of climate change mitigation measures. Others in New Zealand have written about the opportunity to introduce programs that systematically address a reduction in greenhouse gas emissions and an improvement of health equity outcomes. One opportunity could be the introduction of a sustainable energy management plan to retrofit hospitals with solar panels, modernized heating, ventilation, and cooling systems, and energy efficient lighting. The savings from that plan could then be “re-invested into collaborative community projects that create healthy, energy-efficient homes in communities with a high proportion of Māori and Pacific peoples.”³⁴

The gradual loss or deterioration of one’s natural environment also affects emotional and spiritual health — the other pillars of *hauora*. Australian philosopher Glenn Albrecht calls these effects ‘solastalgia.’ Solastalgia is the sense of distress that comes when people witness the effects of environmental change on their home and land.³⁶ It’s a sense of longing for a place or environment that is being lost, has been taken, or no longer exists — the stripping away of a key component of one’s identity.



Sheep farming and cattle rearing are two of New Zealand’s largest industries. Both were introduced to the island in the 18th and 19th centuries following the “discovery” of the island by European settlers. Stats NZ estimates 45% of the country’s land is being farmed for agricultural and horticultural use—sheep and cow farms make up two thirds of that land use. Though important economic drivers, these industries have also greatly affected New Zealand’s native forests, including the ability for them to be accessed by the tribes who whakapapa to that land.

Solastalgia is similar to another term: ecological grief. Ecological grief is a condition that comes as a result of ecological loss. According to one study, ecological grief caused by anthropogenic environmental change has been linked to “acute and chronic mental health experiences, including: strong emotional responses such as sadness, distress, despair, anger, fear, helplessness, hopelessness and stress; elevated rates of mood disorders, such as depression, anxiety, and pre- and post-traumatic stress; increased drug and alcohol usage; increased suicide ideation, attempts and death by suicide; threats and disruptions to sense of place and place attachment; and loss of personal or cultural identity and ways of knowing.”³⁷

Dr. John Perrott, the expert in *Mātauranga Māori*, says contemporary Māori use the term ‘land sickness’ to describe a concept similar to solastalgia and ecological grief. In the context of Māori communities, land sickness affects people in two ways: through the misuse of ecosystem resources (the loss of *taonga* or treasures) and Māori disenfranchisement from land management decisions (a loss of *mana* or authority).³⁸



Hone Moetara is a *rongoā rākau* and *mirimiri* therapist at *Pirirakau Hauora* health center in Te Puna.

Hone Moetara, the *rongoā* practitioner in Te Puna, says the loss of land affects his work. For one thing, there is a lack of resources for traditional practices. “Our bush is getting further and further away from us. The seed banks are taken off the soil due to farming. We have to go out of the area to find traditional medicines. That’s really hard for our families because they’re not in a place where they can afford to search for what you should be able to find outside your backdoor.”

Ecological grief is also caused by an inability to fulfill *manakitanga*,^{xviii} the act of being hospitable to guests. Dr. Rhys Jones offers the example of tribes who have experienced contamination of their traditional food sources or shifting patterns of availability of that food because of land use change, pollution, or climatic disruption. This not only affects Māori from a nutritional perspective “but because it’s a source of *mana* and esteem for local people. If I come from a coastal area and we have visitors, it’s a source of pride to be able to provide the local food. [...] Not being able to fulfill your cultural obligations can have negative impacts on mental well-being,” Jones says.

^{xviii} A tribe’s spiritual power or sense of authority.

Philosopher Glenn Albrecht notes that land loss from environmental change can mimic the displacement that first happened when European settlers forcefully relocated Indigenous communities worldwide. This compounds the fact that climate change is already seen as a manifestation and intensification of colonialism. An excerpt from a 2019 article by Rhys Jones for the journal “Global Health Promotion”:

“Indeed, the worldviews, values, and systems that underpin the colonization of Indigenous peoples are also at the root of environmental changes that threaten local and global ecosystems. Modern Western societies are underpinned by anthropocentric understandings of the world and individualistic values, and tend to associate consumption with improvements in quality of life. The resulting capitalist systems have driven the commodification and exploitation of natural resources, with societies pursuing economic growth while externalizing the negative environmental impacts.”³⁹

To understand the effect of colonization on Māori health requires some historical retrospective into the relationship between Aotearoa’s first people and European settlers.

Aotearoa and the Crown: A Disturbance of Taonga

Māori were the first human inhabitants of Aotearoa, arriving from East Polynesia between 1200 and 1300 AD.⁴⁰ A seafaring people, the Polynesian explorers “discovered the country on deliberate voyages of exploration, navigating by ocean currents and using the wind and stars.”⁴¹ The stars and sky continue to be of great significance to *Mātauranga Māori*. For example, the Māori calendar, Maramataka, is based on lunar cycles that dictate scheduling around planting and harvest; *matariki* is the name for the Pleiades, a cluster of stars used to signify the Māori New Year and predict climatic conditions for the coming season.

European settlers or Pākehā^{xix} first came to Aotearoa in 1642 with the “discovery” of the island by a Dutch explorer. British explorers made three voyages to Aotearoa starting in 1769, laying the groundwork for their eventual colonization of the islands. The next half century led to the introduction of Christianity from English and French missionaries and increased access to trade. There are certain similarities between the European colonization experience of Māori and other Indigenous groups worldwide. These interactions led to the spread of infectious disease, certain groups gaining preferential access to food and firearms which escalated tribal wars,⁴² and disempowerment and depopulation. By 1896, the Māori population was estimated at 42,000 people, a decline from a population of 70,000-90,000 half a century prior.⁴⁴

A landmark event in New Zealand’s history occurred in 1840 with the signing of Te Tiriti o Waitangi, the Māori language text of the treaty between the British and North Island *hapū*. The English version, the Treaty of Waitangi, was signed later. Domestic law recognizes the two documents as the basis of the relationship between the British Crown and Māori.

However, there’s one issue: though often considered interchangeable, Te Tiriti o Waitangi and the Treaty of Waitangi are dramatically different. ⁴⁵ “[Article 2 of] Te Tiriti reaffirms Māori *tino rangatiratanga*, which is a declaration of self-determination,” says Dr. Heather Came, whose PhD research related to Crown breaches of Te Tiriti agreement. “In the [Treaty of Waitangi] many argue that Māori surrendered their sovereignty to the British Crown.”

Both documents contain articles governing the Crown-Māori relationship. Though neither health nor *hauora* are directly

referenced in either version, Article 2 affirms that Māori remain in charge of themselves and will be able to protect their *taonga*, the name for treasured possessions including health, *whenua* (the environment) and other sacred places, *te reo* (the Māori language), *whakapapa*, and all other material and non-material treasures.⁴⁶ Article 3 guarantees Māori the same rights as British citizens, including health equity. More recently, the New Zealand government created a series of treaty principles that must be followed by the Crown, including the three most commonly referenced: participation, protection, and partnership.⁴⁷ In 2019, these principles were named reductionist and outdated.⁴⁸

“Within days [the Crown] started breaching Te Tiriti and haven’t stopped,” says Came. There’s ample legal validation to back her observation. In 1975, the New Zealand government established the Waitangi Tribunal. The tribunal is the legal process that hears and investigates claims that the Crown has breached the text of either treaty. The tribunal’s 20 members are the permanent commission of inquiry charged with interpreting both texts, and the body has reported on more than 1,000 claims — though more than twice that number have been registered and await the legal process. Though recommendations from the tribunal are not binding, many have been incorporated into government legislation or used to create new institutions.

Most of the Waitangi Tribunal’s business to date has focused on claims of historical treaty breaches by the Crown, with the Tribunal hearing these claims on a geographic, district by district basis. The Tribunal has more recently started to consider claims of national significance on a thematic (or *kaupapa*) basis. The first of these looked at issues surrounding military veterans. The second *kaupapa* inquiry initiated by the Tribunal looks specifically at health services and outcomes for Māori.

The health *kaupapa* inquiry (known by its reference number, Wai 2575) began hearings in 2018 and focused initially on primary health care. The Tribunal released its report in July 2019, ruling that the Crown had failed in its treaty commitments to ensure equitable health outcomes for Māori. Another Tribunal report focused on Māori mental health was published a month later.

The tribunal references Ministry of Health statistics in its findings⁴⁹: Māori are more than 2.5 times more likely to die from

^{xix} Pākehā is the name for New Zealanders of European descent and other non-Māori. Tauīwi is the term used for all non-Māori.

xx Before moving forward, what are the primary determinants of health that you think are playing a role in these health inequities?

cardiovascular disease and more than five-and-a-half times more likely to be hospitalized for heart failure compared to non-Māori. Māori are twice as likely to die from all types of cancer. Māori babies account for a higher number of sudden unexplained deaths, and suicide rates are higher than in non-Māori demographics. The list goes on.^{xx}

“Māori health inequities are not only caused by health issues, but are influenced by a wide range of factors including income and poverty, employment, education, and housing – termed the social determinants of health,” states the tribunal. It also attributes inequities to the long-term impacts of colonialism, noting the ongoing existence of institutional racism.⁵⁰

Claimants who testified as part of the mental health tribunal brought up dozens of issues, including the lack of culturally appropriate mental health services, the failure to accommodate *Mātauranga Māori* knowledge and *rongoā* in healthcare policy, the need to interlink mental, physical, and spiritual health, and the suppression of Māori health practices and protocols.⁵¹

Today, these health and socio-economic inequities are usually considered a common thread binding Indigenous communities, writes Sir Mason Durie, the conceptualizer of a number of Māori health models. “However, the defining element of indigeneity is not colonization, socio-economic disadvantage or political ambitions. Instead, most Indigenous peoples believe that the primary starting point is a strong sense of unity with the environment — and a healthy environment.”⁵²

The Wai 2575 inquiry brought up much bigger questions: is it possible for New Zealand’s Western-influenced healthcare system to recognize the interconnected identities and needs of Māori tribes when the worldviews of each are diametrically opposed? What is the role of a healthcare system or its practitioners in ensuring a healthy environment?

New Zealand has made some progress in incorporating Māori worldviews in its strategies and approaches. While the system is far from perfect, it offers some examples of the first steps that can be taken to better integrate human health, well-being, and the natural world.^{xxi}

xxi Successful intercultural health services vary from country to country, and from context to context, however, they all share some common principles. What do you think these are?

Whānau Ora: Reconstructing Contemporary Healthcare Systems With a Māori Worldview

Recall the building blocks of Māori society. Rather than considering individuals as the smallest social group, Māori see this as *whānau* — extended, multigenerational families.

Since 2002, “Whānau Ora” has been New Zealand’s overarching effort to incorporate Māori cultural values into a health initiative. Whānau Ora is defined as “Māori families supported to achieve their maximum health and well-being.”⁵³ However, there was arguably little specific action dedicated to achieving this aspiration, leading to the establishment of a targeted Whānau Ora program by the Government in 2011.

The Whānau Ora program was led by Dame Tariana Turia (*Ngāti Apa, Ngā Rauru, Tūwharetoa*), then a government minister, and informed by a taskforce chaired by Sir Mason Durie. Durie explained the approach during an address to the Royal Australasian College of Physicians: “If *whānau* are going to be well in the future this is well outside the health sector alone. It includes education, social development, economic and employment concerns, housing. On a community level, the aim of Whānau Ora is to bring those interests together. *Whānau* don’t live their lives in silos.”⁵⁴

As a result, Whānau Ora isn’t solely a health program. Instead, it aims to acknowledge the interconnectedness between people’s lives and the role that natural and built environments play in achieving overall health and well-being.^{xxii}

A Whānau Ora Approach to Type 2 Diabetes

Adding to the list of health inequities, type 2 diabetes and its complications are more common among Māori and Pacific communities than other ethnicities.⁵⁵ A new Māori-designed primary care program called Mana Tū is “aiming to improve diabetes outcomes and reduce disparities in incidence, hospitalization, and mortality rates by transforming primary health care.”⁵⁶

Mana Tū is overseen by the National *Hauora* Coalition (NHC), a Māori-led primary health organization. It’s one of the best examples to-date of an intervention that incorporates Māori experience and values. The program’s design addresses the social connectedness of Māori communities and acknowledges that it’s not possible to treat an individual alone.

xxii How would you integrate the Māori worldview if you were to co-design a health system with them? What would be the defining elements?

Developed in collaboration with a diverse group including secondary care clinicians, dental specialists, nurses, social workers, *kaumātua* (Māori elders), and long-term diabetes patients, Mana Tū addresses what Dr. Matire Harwood (Ngāpuhi) says was a failure of mainstream practitioners to serve the needs of Māori and Pacific families. Harwood is the general physician who led the program's research.

“When we had *whānau* designing Mana Tū, they said ‘we don’t [go to traditional clinics] because they tell us off. They just throw more drugs at us. They don’t talk to us about what’s actually going on in our lives,’” Harwood says. “To me, that was key, that idea that doctors thought they knew best, though they likely didn’t have diabetes and may be wealthy and have good health literacy. It was them not understanding the context in which some of these people are living.”

Launched in March 2018, Mana Tū is operating with 200 people at 10 general practice clinics. Nine month data shows promising progress on key indicators: a clinically significant reduction in the group’s Hemoglobin A1C (HbA1c) and weight loss. The program has also shown benefits for entire families: “They’re more likely to go as a *whānau* for walks and take the kids to play at the park. It’s not just being physically active, but spending time together so that social engagement and bonding happens,” adds Harwood.

Mana Tū’s effectiveness will be assessed in two ways over the long-term. The first is similar to western medicine: by using clinical indicators to measure a reduction in physical disease. The second assessment will use Hua Oranga, a tool developed by Sir Mason Durie to measure Māori health outcomes.⁵⁷ Conceptualized around Māori models of health and well-being, tools like Hua Oranga include more qualitative markers of health and well-being.

For example, Hua Oranga gauges the mental health and well-being of an entire *whānau* as opposed to that of an individual alone. It also measures improvements in *waiora*, the sense of spirituality that exists when people are able to protect and be part of the natural world. “I think it’s really important to use some of these Indigenous health outcome tools when assessing the impact of our interventions,” Harwood says. “*Whānau* and *waiora* weren’t being captured by any of the tools we had used before.”

Mana Tū is tailored to some of the central tenants of Whānau Ora and Māori models of health. It taps into the concept of *mana*, a person’s self-authority. “Let’s use our own cultural models and cultural ways of knowing and doing to inform something like taking control of diabetes,” describes Harwood of the program’s approach.

In practice, *whānau* can personalize Mana Tū to meet their needs. It shifts a *whānau*’s first point of contact from a general practitioner to a Kai Manaaki, an appointed community case manager who is more in tune with the cultural needs of the *whānau*. The Kai Manaaki works as part of a primary health clinic team, with general practitioners administering insulin and other medication. Families meet with the Kai Manaaki twice a week at the beginning of the 12-month program in order to develop a relationship. Gradually, those meetings are held every two weeks, then in self-prescribed intervals after two months.

Despite positive research results, Harwood says her team has faced challenges in getting recognition from mainstream health clinics and funders. She notes that while a Mana Tū approach that recognizes the wider determinants of health could be applied to conditions like chronic obstructive pulmonary disease (COPD) and mental health, proposed programs that draw from Māori philosophy often face hurdles of racism and bias.

Systemic racism and bias are just two of the reasons why many are skeptical that Māori worldviews can be adopted in a colonial policy environment that was never meant to consider them.

Whānau Ora and Māori Models of Hauora: Reality or Rhetoric?

The Whānau Ora program has its challenges and shortcomings. Even its conceptualizer, Sir Mason Durie, admits that, telling the Royal Australasian College of Physicians that implementing the approach has been easier in communities when compared to a government policy level.

Gabrielle Baker (Ngāpuhi) has faced similar challenges from a policy perspective. Baker is a former civil servant who spent 15 years as part of the Ministry of Health’s Māori health policy team. Part of her role involved advising ministers on spending around Māori and Indigenous health, and working on the team that helped create the Whānau Ora program and the country’s Māori health strategy, He Korowai Oranga.

Baker notes the frustrations of working inside government agencies, specifically “that amazing policy was being developed but would sit on shelves and lead to very little change.” She says that despite plenty of rhetoric existing around improving Māori health equity, there remains a lack of funding, ongoing policy stewardship, monitoring, and political will to make the changes needed.

“The ideas of having *whānau*-centered interventions that support *whānau* aspirations, the kind of thing talked about in the Whānau Ora policy, would at most get a few dollars thrown at them,” describes Baker of the government’s approach to Māori health and well-being. Despite some government investment in Whānau Ora, Baker says very little changed for Māori health. Instead, greater responsibility was placed on the shoulders of Whānau Ora providers or families themselves.

The head of one Māori-led primary health organization feels similarly. “The health system in New Zealand is essentially following the British National Health Service (NHS),” says Simon Royal, Chief Executive of the National *Hauora* Coalition. He points out that the NHS is a system tailored to the needs of an individual. “That [individual view is] backed up by insurance and basically all the infrastructure of the healthcare system. All algorithms for funding or public policy are generated out of a view about the relative importance of the individual vis a vis the group. This is why the Whānau Ora concept has been significant but it’s been bastardized by the Crown because they didn’t allow Māori to roll it out.”

Royal, along with National *Hauora* Coalition Trustee, Henare Mason (Te Arawa and Ngāi Tahu), was a claimant in stage one of Wai 2575, the Waitangi Tribunal inquiry into Māori primary health care. The recent ruling of the tribunal validates the demand for a health system that is not only designed by Māori, but also managed by them. It calls for the establishment of an independent Māori health authority as a way to end the health disparities facing communities.⁵⁸



Simon Royal, Chief Executive of the National *Hauora* Coalition.



Janice Kuka (Ngāti Ranginui, Ngāi Te Rangi) was another of the claimants in the first stage of Wai 2575. Kuka is the Managing Director of Ngā Mataapuna Oranga (NMO), another Māori-led primary health organization. She says the next step following the ruling is to look at what systems and models could inform the creation of an independent health authority. That could mean drawing on multiple Māori models of health or, as has been the case at NMO, designing new models based on the unique needs of each tribe. There’s also a call for the New Zealand Public Health and Disability Act to be updated to better include Te Tiriti o Waitangi.

Reweti Te Mete, Janice Kuka, and Cindy Mokomoko all advocate for an independent, self-determined Māori health authority. They’re hopeful a 2019 Waitangi Tribunal report will open the doors for much-needed change.



Alaska's Nuka System of Care

Many Māori health leaders point to the Nuka System of Care as an example of a model that more holistically serves the needs of Indigenous communities. The system was created by Alaskan Native people, and is overseen by the Southcentral Foundation, a nonprofit healthcare organization based in Anchorage, Alaska.

According to Southcentral Foundation's President and CEO, Katherine Gottlieb, the Alaskan Native population historically experienced health disparities similar to those faced by Māori communities. Patients were waiting an average of four weeks to get an appointment or were only coming in for emergency care. "There was a disconnect between care for the mind and care for the body," Gottlieb writes.⁵⁹

In 1975, the United States government passed the Indian Self-Determination and Education Assistance Act. That legislation was the beginning of the federal government handing over self-rule for tribal authorities across the country. Southcentral Foundation took full ownership and management of the Alaska Native Medical Center in 1999 and redesigned the services to be more culturally appropriate.

The Nuka System of Care was the result. Gottlieb says one advantage of the system is that it's more responsive to the needs of families. For example, when a recent needs assessment found there was a gap in oral health care for youth, Southcentral Foundation started building a new program with this target population in mind. Survey results that demonstrated an increased need for behavioral health and addictions services led to the creation of new substance abuse activities and more beds dedicated to the detox program.

Gottlieb wants to be clear: it's not just Indigenous communities that benefit from holistic, patient-centered systems of care. "If we started with the population we're serving to see what their highest needs are and then addressed them, it would change health disparities across the United States. [Southcentral Foundation] did this and it just so happens that Alaskan Natives are our target population," she says, adding she'd do the same thing in any other state. "Engaging a community is key to address health outcomes."

For Hone Moetara, the *rongoā* practitioner at the start of this case study, an independent Māori health authority may mean the ability for him to get funding and support to continue creating traditional medicine. That demands not only recognition of the role Māori medicines and approaches to well-being play within healthcare, but also the importance of being able to harvest from the government's Department of Conservation sites.

"It's the need for an entirely new system where we're not butting up against red tape across all systems — academia, health, and conservation," Moetara says. For Māori, it's not only about physical health but about every element of one's identity: a balance of spiritual, physical, mental, emotional, and community needs. Determining whether those needs can be met within New Zealand's existing healthcare system is still an open question. What is certain, however, is the need to better include the holistic way in which Māori derive their sense of personhood: through a connection with one another and with the land.

Epilogue: Learning from Mātauranga Māori

There is no one approach to infuse the principles of planetary health into policy worldwide—as we’ve seen in this case, deconstructing systemic bias and entrenched silos is a significant challenge even when there is political will and a guiding holistic vision based on Māori worldviews. Planetary health practitioners by definition recognize the empirical connection between human health and the environment; this understanding and the solutions we create as a field should be deepened in learning from the values that underpin Māori and many other Indigenous worldviews of health and well-being.

Whakapapa reminds people of their connection to one another and to the environment, and demands learning from the past and considering the future. It also creates a sense of belonging within the world which can act as a moral lens through which to filter our actions. *Mana* outlines the importance of agency so people can be physically, mentally, socially, and spiritually well. *Tino rangatiratanga* gives families the self-determination to choose what’s best for themselves. *Kaitiakitanga* reminds us to be guardians of the natural environment. *Taonga* highlights the true treasures worth protecting: one’s natural environment, health, family, culture. Finally, Indigenous worldviews demand a respect for partnership and collaboration to understand sense of place and context when designing and implementing solutions to the challenges we face in the Anthropocene.

Ultimately, it’s about learning from *Mātauranga Māori* to remember that all of our systems are interconnected. Those connections have been evident throughout this case study anthology. A dam in the Senegal River led to an upstream spike in schistosomiasis for villages that depend on that water source. Men logging the rainforests of Borneo were doing so in order to pay for their family’s healthcare. The hunting of lemurs and other wildlife in Madagascar that has pushed species to the brink of extinction is often a necessary source of nutrition. Human behavior in Fiji’s watersheds has contributed to a higher risk of water-borne disease. Each of these cases illustrate how the health of humans and the Earth’s natural systems must be considered as a complex, dynamic whole.

A full appreciation of that interconnectivity demands empathy towards others and towards the Earth. If you don’t feel emotionally connected to the natural world through stories and experience

then you’re not going to protect it or mourn its loss, reflects Dr. John Perrott. “Part of who you are is a sense of belonging, but that comes from associating with something bigger than yourself,” he says.

Māori worldviews are but one example of how we can step away from an individual mindset and become part of a paradigm that harmonizes rather than prioritizes human health over environmental well-being.

Keeping Track of Who's Who

Gabrielle Baker (Ngāpuhi)

Former civil servant with the Ministry of Health's Māori health policy team

Dr. Heather Came

Senior lecturer based in the Taupua Waioira Centre for Māori Health Research, Auckland University of Technology

Sir Mason Durie (Rangitāne, Ngāti Kauwhata, Ngāti Raukawa)

Māori health expert and conceptualizer of several models of Māori health promotion; chair of the Whānau Ora taskforce

Pete Edwards (Te Rarawa, Te Aupouri, Ngā Puhi)

PhD student of Dr. John Perrott and researcher studying kaitiakitanga

Dr. Matire Harwood (Ngāpuhi)

General physician and head researcher for the Mana Tū diabetes program

Katherine Gottlieb

President and CEO, Southcentral Foundation in Alaska

Dr. Rhys Jones (Ngāti Kahungunu)

public health physician, co-convener of OraTaiao, Senior Lecturer at Te Kupenga Hauora Māori (TKHM), University of Auckland

Janice Kuka

(Ngāti Ranginui, Ngāi Te Rangi)

Managing Director, Ngā Mataapuna Oranga

Hone Moetara

(Ngāpuhi)

Rongoā practitioner with Pirirakau Hauora

Cindy Mokomoko

(Te Rarawa, Te Arawa)

Managing Director, Te Puna Hauora Ki Uta Ki Tai

Dr. Rose Pere

(Ngāi Tūhoe, Ngāti Ruapani, Ngāti Kahungunu)

Managing Director, Ngā Mataapuna Oranga

Dr. John Perrott

(Te Arawa, Ngāti Pakeha)

Expert in Mātauranga Māori with the Auckland University of Technology

Simon Royal

Chief Executive, National Hauora Coalition

Apanui Skipper

(Ngāti Tamaterā, Ngāti Raukawa)

Researcher of Mātauranga Māori and traditional ecological knowledge

Reweti Te Mete

(Ngāi Te Rangi)

Project Manager, Ngā Mutaapuna Oranga

Dr. Issac Warbrick

(Ngāti Te Ata, Te Arawa, Ngā Puhi)

Exercise physiologist and Senior Research Fellow and Director of Taupua Waioira Centre for Māori Health Research, Auckland University of Technology.

Acknowledgements

This case study would not have been possible without the trust extended and stories shared by a number of folks across Aotearoa. To everyone whose voice is included in this case: a heartfelt thank you for your patience in sharing your knowledge and helping the author untangle her own colonial understanding of health and the environment. Thank you to Hector Kaiwai and Georgina Martin from the Whānau Ora Commissioning Agency for spending hours speaking with me about the systemic bias and institutional racism that *whānau* face within the New Zealand health system. Professor Kate Diesfeld and Dr. Valance Smith from the Auckland University of Technology were instrumental in helping me connect with the right folks from their institution. Thank you, too, to Laura Goodall and her writing and advice around approaching the topics mentioned in this case. Gabrielle Baker came onboard with her edits and expertise, and I'm eternally grateful for that. Gordon Lamb and Daniel Fortin were generous enough to open their home to me during my time in Auckland.

Finally, to Indigenous nations worldwide: it is my sincerest hope that the planetary health community can use its privilege and power to elevate your diverse worldviews and ways of knowing. Your guiding values, expertise, and stories are needed now more than ever before.



The kawakawa plant is a commonly used healer in Māori culture. The holes in the leaves are caused by the Kawakawa Looper Moth caterpillar. While the practices of healers differ greatly, one school of thought is that the more holes a leaf has, the more medicine it holds (because it's trying to heal itself).

Bibliography

- ¹ “Te Kupenga 2013.” Stats NZ. 2013; http://archive.stats.govt.nz/browse_for_stats/people_and_communities/maori/TeKupenga_HOTP13.aspx
- ² “Iwi cultural well-being from Te Kupenga 2013.” Stats NZ. 2013; <https://statisticsnz.shinyapps.io/tkpie/>
- ³ Institute of Environmental Science and Research Ltd., et al. “The Future of Rongoa Māori: Well-being and Sustainability.” October 2008; https://ir.canterbury.ac.nz/bitstream/handle/10092/5897/12630629_RongoaMaoriSummaryReport.pdf
- ⁴ “Quick stats about population counts for New Zealand (2018 Census).” Stats NZ. 2018; <https://www.stats.govt.nz/tools/2018-census-place-summaries/new-zealand>
- ⁵ “2013 Census iwi individual profiles.” Stats NZ. 2013; <http://archive.stats.govt.nz/Census/2013-census/profile-and-summary-reports/iwi-profiles-individual.aspx#24540>
- ⁶ WHO. “Constitution of the World Health Organization.” The World Health Organization. 1946; <http://apps.who.int/gb/bd/PDF/bd47/EN/constitution-en.pdf?ua=1>
- ⁷ Durie, Mason. “Whaiora: Māori Health Development.” Oxford University Press. June 24, 1999. Page 70.
- ⁸ King, Paula. “Māori with Lived Experience of Disability Part 1.” Wai 2575. June 24, 2019; https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_150437272/Wai%202575%2C%20B022.pdf
- ⁹ “Māori health models – Te Whare Tapa Whā.” Ministry of Health. 2017; https://www.health.govt.nz/system/files/documents/pages/maori_health_model_tewhare.pdf
- ¹⁰ “Māori health models – Te Whare Tapa Whā.” 2017.
- ¹¹ “Māori health models – Te Wheke.” Ministry of Health. 2017; <https://www.health.govt.nz/our-work/populations/maori-health/maori-health-models/maori-health-models-te-wheke>
- ¹² Love, Catherine. “Extensions on Te Wheke.” The Open Polytechnic of New Zealand. 2004; <http://hdl.handle.net/11072/182>
- ¹³ Durie, Mason. “An Indigenous model of health promotion.” Health Promotion Journal of Australia. December 1, 2004; <https://doi.org/10.1071/HE04181>
- ¹⁴ Durie, Mason. 2004.
- ¹⁵ Durie, Mason. “Te Pae Māhutonga: a model for Māori health promotion.” Health Promotion Forum of New Zealand Newsletter 49. 1999; <https://www.cph.co.nz/wp-content/uploads/TePaeMahutonga.pdf>
- ¹⁶ New Zealand Ministry of Health. “He Korowai Oranga: Māori Health Strategy launch - Sir Mason Durie.” Filmed: June 2014. YouTube video, Duration: 14:49. Posted: July 15, 2014; <https://www.youtube.com/watch?v=ypKwMUWSUt4>
- ¹⁷ Durie, Mason. 2004.
- ¹⁸ Te Ahukaramū Charles Royal. “Papatūānuku – the land - Whenua – the placenta.” Te Ara - the Encyclopedia of New Zealand. September 24, 2007; <http://www.TeAra.govt.nz/en/papatuanuku-the-land/page-4>
- ¹⁹ “Mihi – Introductions.” University of Otago. <https://www.otago.ac.nz/maori/world/te-reo-maori/mihi-introductions/index.html>
- ²⁰ King, Darren, et al. “Māori Environmental Knowledge and natural hazards in Aotearoa-New Zealand.” Journal of the Royal Society of New Zealand. June 2007; <https://doi.org/10.1080/03014220709510536>
- ²¹ Morell, Virginia. “Why did New Zealand’s Moas Go Extinct?” Science. March 17, 2014; <https://www.sciencemag.org/news/2014/03/why-did-new-zealands-moas-go-extinct>
- ²² Young, David. “Whanganui tribes.” Te Ara - the Encyclopedia of New Zealand. February 8, 2005; <https://teara.govt.nz/en/whanganui-tribes/print>
- ²³ Roy, Eleanor Ainge. “New Zealand river granted same legal rights as human being.” The Guardian. March 16, 2017; <https://www.theguardian.com/world/2017/mar/16/new-zealand-river-granted-same-legal-rights-as-human-being>
- ²⁴ Buchanan, Kelly. “New Zealand: Bill Establishing River as Having Own Legal Personality Passed.” Global Legal Monitor. March 22, 2017; <https://www.loc.gov/law/foreign-news/article/new-zealand-bill-establishing-river-as-having-own-legal-personality-passed/>
- ²⁵ Magallanes, Catherine J. Iorns. “Nature as an Ancestor: Two Examples of Legal Personality for Nature in New Zealand. Vertigo - la revue électronique en sciences de l’environnement. September 10, 2015; <https://doi.org/10.4000/vertigo.16199>
- ²⁶ Roy, Eleanor Ainge. “New Zealand gives Mount Taranaki same legal rights as a person.” The Guardian. December 22, 2017; <https://www.theguardian.com/world/2017/dec/22/new-zealand-gives-mount-taranaki-same-legal-rights-as-a-person>
- ²⁷ Safi, Michael. “Ganges and Yamuna rivers granted same legal rights as human beings.” The Guardian. March 21, 2017; <https://www.theguardian.com/world/2017/mar/21/ganges-and-yamuna-rivers-granted-same-legal-rights-as-human-beings>
- ²⁸ Samuel, Sigal. “Lake Erie now has legal rights, just like you.” Vox. February 26, 2019; <https://www.vox.com/future-perfect/2019/2/26/18241904/lake-erie-legal-rights-personhood-nature-environment-toledo-ohio>
- ²⁹ Chandran, Rina. “Fears of evictions as Bangladesh gives rivers legal rights.” Reuters. July 4, 2019; <https://www.reuters.com/article/us-bangladesh-landrights-rivers/fears-of-evictions-as-bangladesh-gives-rivers-legal-rights-idUSKCN1TZ1ZR>
- ³⁰ Green, Natalia. “The First Successful Case of the Rights of Nature Implementation in Ecuador.” Global Alliance for the Rights of Nature. <https://therightsofnature.org/first-ron-case-ecuador/>
- ³¹ Baird, Rachel. “The Impact of Climate Change on Minorities and Indigenous Peoples.” Minority Rights Group International. April 2008; <https://minorityrights.org/wp-content/uploads/old-site-downloads/download-524-The-Impact-of-Climate-Change-on-Minorities-and-Indigenous-Peoples.pdf>
- ³² Jones, Rhys, et al. “Climate Change and the Right to Health for Maori in Aotearoa/New Zealand.” Health and Human Rights Journal. June 2014; <https://cdn2.sph.harvard.edu/wp-content/uploads/sites/13/2014/06/Jones2.pdf>
- ³³ Jones, Rhys. 2019.
- ³⁴ Jones, Rhys. 2019.
- ³⁵ Bennett, Hayley and King, Paula. “Pro-equity climate change and environmental sustainability action by district health boards in Aotearoa/New Zealand.” The New Zealand Medical Journal. August 31, 2018; <https://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2018/vol-131-no-1481-31-august-2018/7681>
- ³⁶ Albrecht, Glenn, et al. “Solastalgia: The Distress Caused by Environmental Change.” Australasian Psychiatry. February 1, 2007; <https://doi.org/10.1080/10398560701701288>
- ³⁷ Cunsolo, Ashlee and Ellis, Neville R. “Ecological grief as a mental health response to climate change-related loss.” Nature Climate Change. April 3, 2018; <https://doi.org/10.1038/s41558-018-0092-2>
- ³⁸ Perrott, John. “Ecology of ‘Land-sickness’: putting the *mauri* back into environmental management.” 2015; unpublished PowerPoint presentation
- ³⁹ Jones, Rhys. “Climate change and Indigenous Health Promotion.” Global Health Promotion. April 9, 2019; <https://doi.org/10.1177/1757975919829713>
- ⁴⁰ “A brief history.” New Zealand Immigration. 2018; <https://www.newzealandnow.govt.nz/living-in-nz/history-government/a-brief-history>
- ⁴¹ Wilson, John. “History - Māori arrival and settlement.” Te Ara - the Encyclopedia of New Zealand. February 8, 2005; <http://www.TeAra.govt.nz/en/history/page-1>
- ⁴² Wilson, John. “History – Europeans to 1840.” Te Ara - the Encyclopedia of New Zealand. February 8, 2005; <https://TeAra.govt.nz/en/history/page-2>
- ⁴³ Durie, Mason. “Te mana, te kawanatanga : the politics of Māori self-determination.” Oxford University Press. 1998; <https://trove.nla.gov.au/version/209321797>
- ⁴⁴ Pool, Ian. “Death rates and life expectancy - Effects of colonisation on Māori.” Te Ara - the Encyclopedia of New Zealand. May 5, 2011; <http://www.TeAra.govt.nz/en/death-rates-and-life-expectancy/page-4>
- ⁴⁵ Kāwharu, Ian Hugh. “Te Tiriti O Waitangi – Treaty of Waitangi.” New Zealand History. January 31, 1997; <https://nzhistory.govt.nz/files/documents/treaty-kawharu-footnotes.pdf>
- ⁴⁶ Kāwharu, Ian Hugh. 1997.
- ⁴⁷ “Principles of the Treaty.” Waitangi Tribunal. September 19 2016; <https://www.waitangitribunal.govt.nz/treaty-of-waitangi/principles-of-the-treaty/>
- ⁴⁸ Waitangi Tribunal. “Hauora : Report on stage one of the Health Services and Outcomes Kaupapa Inquiry.” Waitangi Tribunal. 2019; <https://www.waitangitribunal.govt.nz/>
- ⁴⁹ Ministry of Health. “Tatau Kahukura: Māori Health Chart Book 2015 (3rd edition).” Wellington: Ministry of Health. October 2015; <https://www.health.govt.nz/system/files/documents/publications/tatau-kahukura-maori-health-chart-book-3rd-edition-oct15.pdf>
- ⁵⁰ Waitangi Tribunal. 2019.
- ⁵¹ Gassin, Timothy. “Maori Mental Health: A report commissioned by the Waitangi Tribunal on the Way 2575 Health Services and Outcomes Kaupapa Inquiry.” Waitangi Tribunal. August 28, 2019; https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_153087514/Wai%202575%2C%20B026.pdf
- ⁵² Durie, Mason. Indigenous Health Reforms: Best Health Outcomes for Māori in New Zealand.” Unleashing Innovation in Health Care: Alberta’s Symposium on Health. May 3, 2005; <http://www.equinetrust.org.nz/massey/fms/Te%20Mata%20O%20Te%20Tau/Publications%20-%20Mason/M%20Durie%20Indigenous%20Health%20reforms%20Best%20Health%20outcomes%20for%20Maori%20in%20New%20Zealand.pdf>
- ⁵³ “He Korowai Oranga: Māori Health Strategy.” Wellington: Ministry of Health. November 2002; <https://www.health.govt.nz/system/files/documents/publications/mhs-english.pdf>
- ⁵⁴ Royal Australasian College of Physicians. “RACP Congress 2019 - The key to unlocking optimal health, Sir Mason Durie.” Filmed: May 2019. YouTube video, Duration: 13:51. Posted: June 10, 2019; <https://www.youtube.com/watch?v=LNWPFESqynU>
- ⁵⁵ Harwood, Matire, et al. “Mana Tū: a *whānau* ora approach to type 2 diabetes.” The New Zealand Medical Journal. November 9, 2018; <https://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2018/vol-131-no-1485-9-november-2018/7742>
- ⁵⁶ Harwood, Matire and Stewart, Tereki. “Mana Tū: A *whānau* ora approach to diabetes.” April 12, 2019; unpublished PowerPoint presentation
- ⁵⁷ Durie, Mason and Kingi, Te K. R. “A Framework for Measuring Māori Mental Health Outcomes. A report prepared for the Ministry of Health,” Department of Māori Studies, Massey University. 2000; [http://www.moh.govt.nz/NoteBook/nbbooks.nsf/0/2E3845581DC2CF9DCC257F070007CD17/\\$file/Hua%20Oranga%20Kingi%20&%20Durie%202000.pdf](http://www.moh.govt.nz/NoteBook/nbbooks.nsf/0/2E3845581DC2CF9DCC257F070007CD17/$file/Hua%20Oranga%20Kingi%20&%20Durie%202000.pdf)
- ⁵⁸ Waitangi Tribunal. 2019.
- ⁵⁹ Gottlieb, Katherine. “The Nuka System of Care: improving health through ownership and relationships.” International Journal of Circumpolar Health. August 5, 2015; <https://doi.org/10.3402/ijch.v72i0.21118>