

IAN POOL

Māori Health, Colonization and Post-Colonization

Aotearoa New Zealand, from 1769

ABSTRACT The Māori of Aotearoa New Zealand are a case-study of the negative impacts of colonization on the health of precursor peoples, such as indigenous peoples in Australia, the Americas, and northern Eurasia. But, colonization has such effects regardless of whether colonized peoples eventually become “independent,” or are swamped demographically and politically by a settler population. Indigenous peoples still suffer “internal colonialism” after their country becomes independent (from the United Kingdom for Aotearoa), even in social democracies, simply because majorities, through benign neglect or paternalism, often fail to meet the particular needs of indigenous citizens. Incidentally, “independent” ex-colonies do not escape post-colonialism, because they are subject to interventions by powerful international and bi-lateral agencies, such as structural adjustment policies imposed by the World Bank.

This paper uses the epidemiological transition framework, but questions its application to colonized peoples, who often, contrary to the paradigm’s deterministic principle of progress, may suffer “regression” as their very survival is threatened by newly introduced diseases to which they have no immunity. Some, not Māori, even go through

demographic collapses.” The eventual Māori transition did follow the conventional framework, but in its “delayed” form.

Finally the paper shifts from theoretical dimensions into praxis: health services. It identifies stages in the evolution of these as they affect indigenous people. This is a more detailed overview than the conventional view: a shift from social determinants of health change to the impacts of public health interventions, and from the domination of communicable diseases to non-communicable.

KEYWORDS Aotearoa, New Zealand, Māori, Colonization, health, epidemiological transition

Health Development and Colonization

Health is central to—an integral component of—all development. It is no exaggeration to say that trends in health have determined every aspect of the history of the Māori people from their first continuous contact with Europeans (1769, primarily of British origin, termed Pakeha in Aotearoa), through formal colonization (1840–1907), and its aftermath of internal colonialism enduring until the twenty-first century. For colonized people, social and economic development, including health, is very much determined by the processes governing contact and colonization, and by the way that post-colonization plays out.

In this regard, a case-study on Māori, whose post-contact history is reasonably well documented, illustrates issues of broader interest among other indigenous minorities and, indeed, other colonized peoples. This point was emphasized in a classical essay, by eminent, expatriate New Zealand demographer, Wilfred Borrie. He referred to Māori as a “microcosm of the new world,” by which he meant developing countries (Borrie 1959: 248–249). A major aim of this paper is to use the Māori case first as a “microcosm” of the experience of indigenous peoples; adding to the evidence-base and building theory on “precursor peoples” (Belich 2009: 180–181). For indigenous minorities, post-colonialism is still infused with “internal colonialism,” because, even the most benign social democracies that act in good faith, will do so in accordance with the whims of the politically and demographically hegemonic majority. But, additionally, the experiences of indigenous minorities are also analogous to the “neo-colonialism” faced by recent colonies, now politically independent, developing countries. The post-colonialism with which these policies must deal comes from the demands of external agencies, particularly those of the so-called Washington Consensus (e.g. IMF, World Bank) and some bi-lateral agencies. These external institutions en-

force neo-liberal ideologies (e.g. structural adjustments) or often work to ensure that donor countries' interests are paramount. But to take this even further, in the British imperialist era (eighteenth and nineteenth centuries) the metropole itself engaged domestically in processes that bore close resemblance to what was happening overseas in their colonial realms. The Highland and Irish Clearances used the same mechanisms of control, even conquest, and juridical processes to wrest the land from peasants. This was all in the name of progress and efficiency, and had the same sorts of negative impacts (e.g. famine, potato blight). As indigenous minorities such as Māori are now attempting to reassert their rights, so too are the effects of clearances being reassessed, especially in the northwest and Western Islands of Scotland.

This present paper draws very heavily on my just-published book on Māori 1769–1900 (Pool 2015). That book elaborates, reviews and critiques the theoretical frameworks raised in the next section of the present paper, particularly the demographic and epidemiological transition frameworks and emerging paradigms relating to health development. An earlier book also covers the twentieth century (Pool 1991; see also Pool 1985). Another, by Alistair Woodward and Tony Blakely, leading New Zealand epidemiologists, *The Healthy Country? A History of Life and Death in New Zealand* (2014) gives an authoritative account of trends in Māori and Pakeha longevity, particularly its medical and public health dimensions. Indispensable in documenting contexts are many books by historians, notably James Belich (e.g. Belich 1996).

For the entire nineteenth century a critical issue for the people of Aotearoa was whether or not Māori, confronting the invasion of pathogens to which they had no natural resistance, would actually survive as a people. Their saga inspires the meta-theme of my paper: *there is no more primal factor of development than sheer survival*; demography is indeed destiny. This issue is not unique to New Zealand. Overseas, beyond Aotearoa, it is fundamental for other colonized peoples, whose demographic trajectories will also have been moulded by health and mortality trends. These are affected, typically, from their contact with, and colonization by, imperial powers, and/or by control by co-resident hegemonic populations expanding into traditional domains of precursor peoples; examples are, Eurasia's northern polar and sub-polar indigenous minorities. In fine detail, adjacent residence rather than sea-borne colonization may seem to set Eurasian experiences aside, to a degree, from those such as Māori, whose lands were annexed during the period of great European imperial exploration and expansion from the eighteenth to the twentieth centuries. In this regard, though, as Alfred Crosby (1986) reminds us, European expansionism started back in the Viking days in Greenland and elsewhere; in Europe, to take another example,

the English colonized their adjacent Gaelic areas, inflicting “clearances” on Scottish and Irish peasants to expel them from their land (Hechter 1975).

Grosso modo, therefore, ignoring the fine print, what happened to Māori has strong parallels with what happened to other displaced indigenous people in Eurasia, Canada and the United States or Australia, and indeed to colonized people worldwide. The Māori experience is documented—imperfectly, but better than many other histories—so aspects can be extrapolated. A carefully constructed cross-comparative analysis by Frank Trovato linking health to “structural disadvantages,” despite showing differences in levels of mortality and mixes of causes, concludes:

Notwithstanding varying degrees of improvements in the social and economic conditions of the aboriginals of Canada, the United States and New Zealand, varying degrees of inequality [by comparison with non-aboriginals] persist in these societies [...]. Of the three groups in this analysis, Maoris share a more favourable pattern of relative risks [...].

The situation for the Maori appears to have parallels as well as differences with the situations of the two North American aboriginal groups. For instance, like their Canadian and American counterparts, in the multivariate analysis of adult mortality, the ethnic effect for Maoris was substantial (although lower in magnitude than the other two groups). This suggests that, similar to Indians in Canada and the United States, Maoris may share some degree of structural disadvantage (though lower in magnitude than the other two groups). (Trovato 2001: 81–82)

The other scientific value of a Māori case-study is that New Zealand provides a relatively uncontaminated “natural experiment.” They were a totally isolated island population, whose colonizers came virtually from only one source: the British Isles. The same counterpoints of “colonized-colonizer,” and “imperial metropole-colonial periphery” held true for two centuries. From first continuous contact until the 1980s, New Zealand was a bi-cultural settler society, indigenous Māori and British-origin Europeans looking “home” to the “Mother Country,” England.

From early settlement, there was intermarriage, in both formal and informal unions, so that by the end of the nineteenth century the proportion of all marriages conducted by the Auckland Registrar that were between Māori and non-Māori was not far below their percent in the population (4 % vs 6 %) (Harre 1972: 118–131). How typical this was is difficult to say, but at the 2013 census about half Māori male or female couples were in bi- or multi-cultural unions (Didham & Callister 2014). Tahu Kukutai (2011: 50) argues that

the boundaries between Maori and Pakeha [...] have become increasingly complex, influenced by many decades of intermarriage, New Zealand's rapid ethnic diversification, changing ideologies about the nature of ethnicity (broadly construed), and what it means to be Maori.

This fluidity makes data collection problematic for censuses and vital registers (New Zealand does not have Scandinavian-style civil registration). Victorian, settler-statisticians did try to record Māori in ways “that were integral to efforts to civilise, assimilate and integrate indigenes [...] [T]he statistical interest in so-called Māori-European ‘half-castes’ was clearly linked to colonial policies of racial amalgamation” (Kukutai 2011: 48). This detailed update by Kukutai builds on and endorses, but adds new important dimensions to, earlier analyses (Pool 1991: Ch. 2). She shows how New Zealand attempted to use “degrees of blood definitions” until 1981, but has experimented with other questions and coding systems since.

Indeed, diversification accelerated from 1970, as successive waves of migrants arrived, first Pasifika from tropical Polynesia, then more recently Asians, particularly Chinese and Indians, plus others. Intermarriage has intensified, particularly for the triad—Māori, Pakeha and Pasifika—all of whom may be represented in the one family. Today, almost 40 per cent of New Zealanders are of non-European descent. So until about 1980, the “analytical model” of contact and colonization that we can construct is relatively simple, “bivariate,” not complicated until then by successive waves of different settling groups; from 1980, though, it is complex.

For indigenous minorities, colonization does not end as their country becomes “independent” from their metropole; the indigenous minority is still subject to the whims and rule of the demographically and politically hegemonic majority. For sub-Arctic Eurasian minorities the sequence may be different in detail, but the implications are very similar to what happened to Māori. No matter how benign that majority attempts to be in its governance, it is still going to carry out acts which work against the needs of the minority. For example, construction of infrastructure may benefit the entire population, yet run counter to the concerns of the indigenous minority (e.g. if grave sites are to be disturbed). This is not just the fate of indigenous minorities, but applies even to newly, “wholly,” independent ex-colonies, especially in Africa. There, the agencies of the “Washington Consensus” have acted almost in a neo-colonial way in enforcing neo-liberal health and development policies, “structural adjustments,” that attempt to marketize health care and other social sector services, and have had the negative effect of running down health systems. Even from within the World Bank itself, there has been recognition that these policies had left some

countries unprepared for the Ebola outbreak. But this issue is beyond the scope of my paper.

Suffice it to say, the act of colonization, and post-colonial internal colonialism, or indirect interventions post-colonially played dominant roles. Newly independent countries have the option of going it alone, although Guinea was punished by voting “non” in de Gaulle’s 1958 francophone African referendum on association with the metropole. Indigenous minority status just makes the issue more complex, perhaps more intractable; even nomads cannot uni-laterally change their socio-political context. Moreover, even the most sympathetic hegemonic majority, operating a truly democratic regime, may still not appreciate the constraints that they impose on the minority, consciously or unconsciously. For minorities, constitutional accommodation can evolve only in the wider political arena, particularly in terms of the degree of political autonomy accorded indigenous people, with policies that vary between countries, but again this is an issue outside the scope of this paper. Nevertheless, at a service level—as against policy—there can be approaches that attempt to minimize the effects of these constraints. I return to this point in the empirical sections of my paper.

This paper takes the Māori population as a case-study. Its focus is on the way in which colonization disturbed their natural demographic and epidemiological transitions. It then shows how these resumed their normal trajectories to unfold during the twentieth century after the most disruptive elements of colonization had been replaced by post-colonialism, but also by internal colonialism, and by gradual social and health progress. Economic development, including health as an integral component, was negative, with Māori ending the constitutionally-defined colonial period (1907) in an “under-development trap.” This term is inspired by Ricard Nelson’s paper (1956) on “low-level equilibrium traps,” in his case in developing countries. After the Second World War there were far more rapid changes that, to a significant degree, closed health and social wellbeing gaps between Māori and Pakeha, but economic development still dragged.

In the 2000s gaps still remain, so this paper closes by looking at challenges and strategies to overcome these. They are part of a wider context of differences in levels of socio-economic deprivation. One would like to say that “colonialism” in all its forms has disappeared from the dialogue on health policy, and its implementation, but residual effects remain. These are intimately interlinked with vestiges of centre-periphery relations involving control from the capital and central government interventions, sometimes over the protests of local people. Thus, one cannot easily disaggregate centre-periphery and ethnic differentials: on the one hand, like Pakeha, most

Māori (80+ %) live in urban areas, clustered but not extremely segregated (Grbic *et al.* 2010). Māori were never in reserves, but, because of the processes of land-loss (see below) became over-represented in the more isolated, marginal hill country regions in the North Island. Today, Māori are still disproportionately represented in areas that have small population numbers, low densities, characterised by poorer health and lower longevity, and difficult to service (Pool *et al.* 2009).

Concerning Health Development. Theory

This paper's basic frameworks come from demography and the health sciences: the demographic transition (Notestein 1945) and its twin, the epidemiological transition (Omran 1982; for New Zealand, see Pool 1991: Chapter 1). Nevertheless, I question whether these schema apply to Māori, and ask whether or not they also apply to indigenous minorities outside Aotearoa, or other decolonized populations now independent. It addresses some controversies surrounding this transition; notably whether or not its drivers were "economic" or "public health." For developed countries with early transitions, socio-economic factors certainly played a role, particularly before 1920, as Thomas McKeown (1976; Pool 1994 reviews this debate) argued. But, much of the global decline in mortality, occurring mainly in less developed countries, has post-dated effective public health measures used in mass campaigns becoming available (1940s on), vaccinations and anti-biotics, plus DDT, being obvious examples. New Zealand had two epidemiologic transitions, running side by side. The Māori model resembled the Third World's in many ways, yet co-residence with a wealthy population, and even some aspects of paternalistic neo-colonialism did have some advantages for Māori. The chemotherapeutic revolution erupted following the Second World War, reinforcing the important roles played by socio-economic factors and non-pharmacological technologies (X-ray diagnosis).

Any review of colonization and health must also recognise that the analytical frameworks relating to health are shifting rapidly, and these more theoretically driven developments have almost immediate implications for praxis. On the bio-medical side understanding of aetiologies is expanding exponentially, while the micro-biological sciences provides more refined but complex data on the spread of diseases and its human vectors, plus scientific breakthroughs in diagnostic, preventive and curative measures.

The bio-medical sciences were in their infancy in the nineteenth century, so colonialists had no theoretical base on which to build explanations of what they observed. For example, the "absence of children" among Māori and other Native groups was wrongly attributed to the "loss of will to reproduce in the face of superior races," not to the high levels of childhood

mortality. Major developments in medical science, and the chemotherapeutic revolution, largely postdate 1930; the bio-genetic and micro-biological revolutions 1970.

Additionally, economists during decades of neo-liberalism saw health simply as a vexing, costly demand-side burden on the economy, or, even more extremely, a personal responsibility of no concern to the state. But, recently—in publications by the World Bank (1993; 2006) and Stiglitz (2008), for example—it has been recognised that health is a key to the productive sectors, pre-determining human capital deepening. This is hardly a startling new paradigm; UNICEF has long highlighted this in its annual reports, the United Development Programme has proposed Human Development Indices to overcome crude measurements such as GDP and health objectives dominate its Millennium Development Goals. It takes the field of health development back to work, cited above (Nelson 1956), which saw health as an integral component of all development.

Concerning Health Development. Praxis

I turn to service-delivery. In the Victorian era, health interventions were ineffectual, simply because the health sciences were themselves so primitive, so this is essentially a twentieth century story. A partial exception to this was that missionaries had sporadically vaccinated Māori against small-pox. The coverage for these interventions is difficult to establish, but in 1913 Te Rangi Hiroa (1914), in New Zealand's first modern-type epidemiological study, did do an ex-post-facto "case-control" analysis of case-fatality rates of vaccinated and unvaccinated Māori, and the vaccinated seem to have had more resistance. Different strategies were formulated, however, from the start of the twentieth century to deal with problems of Māori health. These varied from programmes targeted specifically at Māori to more general ones that were addressed the whole population but had positive implications for Māori. Generally speaking, although time boundaries overlapped, they went through several phases of increasing sophistication. These depended on the way the issues were addressed, the way they were organised and the available technologies (prophylactic/preventive, diagnostic, curative; equipment; chemotherapeutic and anti-biotic; and exogenous facilitating technologies, such as transport, information technology, etc.). It is impossible to talk about health policy and development without also looking at the mechanisms by which these might be achieved. The Māori experience, outlined later, allows me to develop a framework for the analysis of changes over time in service delivery strategies.

Phase One: Community Health Strategies. These addressed high levels of communicable disease morbidity, particularly water-borne and food-borne, respiratory and acute infectious diseases, by improving village sanitation, constructing latrines, replacing poor housing

Phase Two: Public Health and Social Welfare Strategies. These responded to lower but continuing high levels of communicable disease morbidity. In New Zealand's case, seminal research had identified tuberculosis among Māori to be a major problem, but methods of responding to this disease remained at the pre-antibiotic stages until well after the Second World War. Diagnosis had improved through X-ray technology, and it was recognised that tuberculosis was very much a disease affected by socio-economic conditions—low income, poor diet and inadequate housing. Here transport (mobile X-rays) allowed targeting and welfare (the Social Security Act 1938), provided income, housing and nutrition. The hospitalisation of almost all parturitions improved maternal and child health.

Phase Three: Public Health Social Welfare and Chemotherapeutic Strategies. The expanding availability of chemotherapeutics after the Second World War strengthened the prophylactic and curative dimensions of public health, including universal delivery; for example mass immunisation using the new vaccines. This phase saw public health becoming more aware of the non-communicable diseases, notably cancers and heart disease, and the effects of avoidable life-styles, such as smoking. For populations with lower health statuses a double-burden of disease—communicable plus non-communicable—had appeared. From the 1970s, combating non-communicable disorders became prioritised.

Phase Four: Sectorally Integrated Services within the Health System. From the end of the twentieth century four aspects of health received attention. First, there was a “compression” in causes, with more and more of all deaths occurring in two broad groupings of disease, cardiovascular and cancers, with a shift-share between the first and second of these. This was seen in the better-off developing countries as well as the more developed. Concern arose about factors such as diabetes and obesity, as well as lifestyle-related causes of ill-health. Secondly, survival levels were becoming so elevated that most cohort members survived to 75–80 years or older. There was also “compression” occurring in the ages at which deaths were occurring. At the younger ages below the median age of death, increasing percentages were dying close to the median, but above the median ages at death were extending, albeit gradually; the curve of mortality peaked sharply to the median, but

its right-side tailed. Earlier studies focusing on the mean had been affected by extreme values, the few infants dying neo-natally, whereas the median and mode reflect typical patterns (Pool 1994; modeled in Cheung *et al.* 2005). Thirdly, because of these factors health care became concentrated in the hospital sector, which was charged with undertaking costly procedures, often involving high technology. By contrast, community-resident patients required lower cost pharmaceutical props, plus support services delivered by carers who were trained but less skilled. Thus, in developed countries strategies attempted to shift services into the primary sector, to general practitioners, para-medicals and services supporting patients at home rather than hospital. Fourthly, some sub-populations proved more difficult to service, typically ethnic minorities, residents of more isolated, marginal, poorer regions, and the less well-off in general. The interplay of peripheral residence—whereby distance from services becomes significant for monitoring, screening and follow-up to clinical care and these socio-cultural factors makes this dilemma more problematic. In New Zealand, the exogenous technologies of transport and information technology become even more critical for Northland or the East Coast where Māori are heavily represented; in Sweden for the north and Sami; in Canada and Alaska for the sub-polar regions where Indian and Inuit are distributed across vast spaces; and for the centre and tropical north of Australia, where Aboriginals reside, sometimes engaging in “hybrid” economies (Altman & May 2011). In urban areas, where geographical distance is less of an issue, social distance and costs of medical care are still of significance (even in universal free systems some costs evolve to patients and their families). Screening at a primary level becomes an efficient strategy (Pool *et al.* 2009).

Contact (1769) and Colonization (1840). Introduced Diseases and their Impacts

Emerging bio-medical evidence and theory gives a better understanding of what happened on contact and colonization to peoples isolated from the major global killers flowing around Eurasia and Africa. These pathogens were introduced on contact and to colonies such as New Zealand producing disastrous effects (Crosby 1986). It is essential to note, however, that, at least in Aotearoa, the exposure to diseases to which Māori had no inherent resistance was an unintended accident of contact. There is no evidence that New Zealand settlers intentionally exposed Māori to disease—unlike what happened in the Americas and Australia (passing infected blankets to Natives). In terms of isolation, Aotearoa, and other parts of Polynesia, were among

the more extreme in this regard, although even the continental Americas and Australia were relatively isolated, from smallpox for example:

The role of epidemics in the history of the Americas was sometimes game-changing: “The truth is that the Spaniards did not succeed in conquering any major state on the American mainland until after a smallpox epidemic had struck [...]. The first pandemic may have ranged from the Great Lakes to the Pampas [...].” (Pool 2015: 63, citing Wright 2008: 29)

That Aotearoa did not suffer the totally catastrophic population collapse recorded for the small, high islands of the Pacific, such as Hawaii and Tahiti, with high coastline population densities, was probably a function of New Zealand’s larger size (Kirch & Rallu [eds.] 2007, exclude it from their study). Disease transmission was more difficult given its lower population densities and large inland populations away from the littorals, while among larger land-masses, New Zealand was the most distant from global reservoirs of infection. Fortunately, therefore, Māori were also never really exposed to the great apocalyptic scourges—smallpox (one small outbreak in 1913 noted above), bubonic plague, cholera, malaria, etc.—or when these threatened they were quickly contained. So this sets the health history of Māori apart even from Australia and the Americas. Instead, for Māori the great killers were the so-called “childhood diseases” of Europe (e.g. measles): the most useful bio-medical model is close to Danish Peter Panum’s (1848) observations in the Faroe Islands, where a long gap between measles epidemics caused deaths at all ages, in contrast with Copenhagen, where measles was a “childhood complaint.” As Faroe Islanders are Europeans, this also shows that the Victorian tendency to attribute Māori mortality to their “inferior” non-European constitutions was unfounded racism.

The most primal—the most Darwinian—of all development issues is the survival of a people. In the Victorian era, the “disappearance of the Maori race” was seen by many settlers as their likely fate, of “little cause for regret” (Newman 1881; Wohlers 1881). But by the 1890s, it was becoming apparent that they would survive; they neither “disappeared,” nor “collapsed” below 40 per cent of their contact numbers. Much of the story up until the end of the nineteenth century was governed by the bio-medical trends of the introduction of pathogens, including both the venereal diseases and the virulent form of tuberculosis prevalent about 1800 across Europe. These took a much more severe form than they did among previously exposed populations. But from about 1860, Māori gradually gained resistance to introduced diseases through exposure, a function largely of more and more settlers—the critical mass for reservoirs of infection are important—spreading even to

the more isolated parts of the country. But accommodation was not as rapid as it should have been because the late nineteenth century Māori lost their land and related assets, and also their businesses, which had flourished from the 1820s to the 1850s were eliminated. Then, Māori owned ships had plied successful export trading, to Australia, California and even to Britain, particularly potatoes and grains grown on their land, and pork from semi-wild pigs, like Iberian pig-raising. After annexation, Māori merchants supplied the new Pakeha settlements. The decision of the British governor to invade the Waikato (above all), but also the Bay of Plenty and Taranaki, prime regions of Māori commercial horticulture, was driven in part by the successful Māori competition with Pakeha.

Huge areas had been “purchased” by the Crown prior to the second New Zealand Wars (1860s), but in areas where relatively few Māori lived. But, the real land-loss for most Māori, North Island tribes, came first through confiscations (mainly 1860s) of land from those who opposed the Crown. This was followed by the enforced individualization of titles (1860s), which was implemented through an operationally highly-flawed juridical process (innocently titled the “Native Land Court”). Even Victorian commentators criticised its operations, including a major parliamentary report (e.g. Rees *et al.* 1891). By 1890, Māori were a socio-economically deprived population in one of if not the wealthiest countries in the world at that time. Consequently, Māori health did not improve, but the determinant was now more socio-economic factors than the predominantly bio-medical processes of lack of immunity then gradual gains in resistance that had been critical previously. In 1896, life expectation at birth, $e(0)$, was well below the level it had been at when Māori had made continuous contact with Europeans, perhaps from 30 years down to 20. This contrasted with Pakeha levels: from the first reliable records (1870s) among the highest $e(0)$ s in the world; Pakeha women were the first to reach 55 years life expectation, then 60.

Explaining the high longevity of Pakeha is beyond the scope of this paper, but are documented (Pool & Cheung 2005). Suffice it to say, it was not because of the health services, but because of their high standards of living and incomes. Pakeha were well fed—overfed meat protein—all year round, much better than their British contemporaries. The first data showed that they were taller and heavier even than North Americans. Families lived in separate dwellings (there were no tenement slums), so the spread of respiratory disorders was limited. Urban densities were low, and thus, despite inadequate piped water—animals grazed in catchment areas—or sewage systems, diarrhoeal and dysenteric disease mortality was lower than in Britain, and cholera virtually absent.

Thus there was a stark contrast between Māori and Pakeha, who were

well advanced in their epidemiological transition. By 1901, their demographic transition was advanced, with low mortality by the standards of the day, and a radical fertility decline from a TFR of 7.0, the highest in industrialised countries, in 1876, to one of the lowest (1901 = 3.0). This trend had positive impacts on maternal and childhood mortality. Māori were polar opposites, because nineteenth century contact and colonization had seen both the demographic and epidemiological transitions regress, contrary to conventional theories. The demographic transition model posits systematic shifts, from an early stage with high fertility but major fluctuations in high mortality rates and short-term regressive periods of negative growth, to a last phase of very low fertility and mortality. The epidemiological model also progresses from high mortality due mainly to communicable causes having their greatest force on children, to low mortality mainly from non-communicable causes, but the force now on geriatrics. By contrast, the Māori regressions—mainly from communicable disease mortality, reinforced by sexually transmitted infections that reduced fertility—lasted almost a century, say 1805 to 1895. I would postulate that this lack of fit between the models and experience applied to most colonized peoples.

Finally, war also affected mortality rates and blocked development. This contrasts with the story told by the Imperialists, and by latter-day revisionists: that colonialism helped spread technology, and that the generally avuncular imperial governance, allowing a *pax Britannica*, accelerated progress for Native peoples. This was the theme underlying Queen Victoria's Jubilee (1897), when the grateful Empire's subject-peoples' military representatives marched through London. This triumphant party blissfully ignored history: the Highland clearances had just been stopped (1882); the Zulu War finished; the Second Matabele War underway, where, as for its predecessor and the conquest of Uganda, good use was made of machine-guns; at the Battle of Omdurman (1898) thousands of Mahdi cavalry, wielding spears, fell to the Maxim-gun, proudly endorsed by young Winston Churchill; the "one hundred years" Ashanti Wars were yet to finish; and the Boer War soon to begin—plus others I have not listed here, including frequent frontier battles in India or the second Afghanistan campaign. Colonial wars, on a lesser or greater scale, continued really until independence was granted, and sometimes after, as for the Katanga secession after Congo gained nationhood. So much for the peace and progress brought by Imperialism.

Nor was Aotearoa immune from this trend: the First New Zealand Wars (1840s), the Second (1860–1872), the invasion of Parihaka (1881), and even other minor conflicts such as the Dog Tax War, constituted conquest and heavy-handed policing to extend British rule. In Rawene (1898) a naval ship, machine-gun and 130 soldiers killed two Māori protesting dog taxes. But, by

any standards, the earlier Second Wars in the Waikato, Taranaki-Whanganui, the Bay of Plenty and across to Poverty Bay, were major colonial campaigns, involving 27 per cent of all British troops outside India, from where regiments had been dispatched, and the United Kingdom, plus colonial militia and Māori loyal to the Crown. All these resources against a few thousand Māori insurgents. Using Vincent O'Malley's data (2014, I used an earlier report for the Waitangi Tribunal), Māori war fatality rates in the Waikato significantly exceeded New Zealand's very high First World War death rate, almost 2 per cent of the entire 1916 population. Add in "scorched earth" campaigns in the Urewera, which greatly increased civilian deaths, plus confiscations of land, usually the most productive, nominally taken from the combatants but also from Crown supporters, and the expulsion of Māori from the Waikato and coastal Taranaki. Warfare was definitely a major lethal and disruptive factor in Māori life from 1840 to Queen Victoria's Jubilee. In the Waikato during the Second Wars, "normal" Māori deathrates were perhaps 40 per 1,000, to which as much as 20 per 1,000 can be added for war fatalities.

The Twentieth Century

Century-wide. Two Separate Transitions then Convergence

In 1907, New Zealand became a nominally independent "White Dominion" (alongside Canada and Australia). But it remained closely associated with the "Mother Country," a link severed more formally in a *de jure* way in 1947, but in *de facto* ways only in the late 1960s when Britain, which had been New Zealand's major trading partner and the beneficiary of "Empire Preferences," suddenly entered the Common Market. For Māori, these constitutional changes were something of an abstraction as internal colonialism, in varying forms, persisted, to a degree affecting their daily lives. It differed between unthinking, merely paternalistic acts, to conscious interventions that favoured the majority at the expense of Māori. For example, there was the forced sale of pockets of remaining Māori land because individualization of titles had created multiple ownership of tiny parcels of land, or under Public Works Acts—for example to construct wartime airfields and other infrastructure—and then the resale of this land to Pakeha, not to Māori.

At first Māori *e(0)s* improved gradually, but increased dramatically immediately after the Second World War. Over the twentieth century Māori passed through most stages of the demographic transition as conventionally outlined, and by CE 2000 were at the last phase (nearing replacement level fertility and relatively high life expectancy, above the world as a whole). Yet, their survivorship levels remained below Pakeha throughout the twen-

Table 1. Proportion (%) of each birth cohort reaching exact ages 5, 45 and 75 years, Māori and Pakeha (Synthetic life-tables)

YEAR	MĀORI			PAKEHA/NON-MĀORI		
	5	45	75	5	45	75
1896						
Male	55	29	4	89	75	30
Female	51	24	3	90	76	37
1946						
Male	85	62	20	96	89	41
Female	87	61	15	97	91	51
2006						
Male	99	92	46	99	96	72
Female	99	96	58	[99.5]	98	81

Source: 1896 and 1946, tables prepared for Pool & Cheung (2003); 2006 Official Life-Tables.

tieth century, in part because Pakeha $e(0)$ s continued to improve and were in the highest group of expectancies worldwide. A Māori epidemiological transition also unfolded during the twentieth century, along its expected trajectory through the phases as outlined by Abdel Omran's 1971 framework (Omran 1982), after being stalled and regressing in the nineteenth. There was a shift from communicable to non-communicable diseases. The first reasonably reliable set of death certifications, 1945, shows the preponderance of the communicable causes for Māori: 54 per cent of their deaths. This level was far higher than that already experienced by Pakeha (13 %), who in 1876 had last experienced levels like Māori in 1945. But by 1976, a convergence was occurring: 25 per cent for Māori, 12 per cent for Pakeha. While they are not age-standardised, these proportions show strong trends for Māori, more than could be due to age-composition effects (confirmed Woodward & Blakely 2014: e.g. age-standardised Fig. 25).

Accompanying the movement towards non-communicable diseases and longevity increases was a shift in the force of mortality from young to older ages, shown in Table 1 (per cent of each cohort born alive surviving to selected ages). These statistics dramatically encapsulate the essentials of epidemiological transition. At the end of the Victorian period, using indirect estimates, a bare 50 per cent of Māori reached 5 years, whereas, using virtually complete registration data, most Pakeha survived to that exact age. So heavy was the force of Māori mortality at childhood, that, in the 1890s at age 38 years, a woman would have had the same life-expectancy (years) that she had had at birth. Analogously, the 42 per cent decline in Pakeha

under-five mortality rates accompanying a rapid fertility decline, 1876 to 1896, had cohort momentum effects that drove favourable life expectancies (on a world-wide basis) until the Second World War (Pool & Cheung 2005). By 1945, at childhood there had been significant improvements, but Māori still had a long way to go to catch up. Today, by contrast, Māori survivorship rates until age 45 have converged towards the non-Māori, but major differences emerge between 45 and 75 years. Only a minority of non-Māori die before age 75 years, almost no-one before age 45. Yet, half the 92 per cent of Māori males alive at middle-age will not reach mid-retirement ages, whereas three-quarters of their non-Māori peers will. These differences are partly due to cohort effects to which I return below.

The net result of these changes was, of course, increases in longevity: Māori $e(0)$ s were about 48 years for both sexes in 1945, as against 67 for Pakeha males and 70 for females in that year. By 2006 there had been an incomplete convergence, with the Māori male $e(0)$ 70 years, and the female 75; for non-Māori males the level was 79 years and female 83 (to account for the greater ethnic diversity from 1980, I refer to Māori and non-Māori). Thomas McKeown (1976) has argued that declines in mortality in developed countries were driven primarily by socio-economic factors. This certainly fits the earlier stages of the Pakeha transition before 1930, but, as I note below, they also benefited from the chemotherapeutic revolution and other technologies available after the Second World War.

Until 1945

Until 1950, Māori levels of life-expectation were closer to those of populations in developing countries, not Pakeha. All the socio-economic determinants of poor health—for example overcrowded housing, malnutrition, poverty—were evident in New Zealand, recorded in a rigorous survey on tuberculosis in the early 1930s (Turbott 1935). Before 1900, the colonial regimes had not successfully implemented health development, for either Māori or Pakeha; health planning and services were unsystematic, fragmented and ineffective, for everybody. But, the Liberal government of the 1890s and early 1900s, in whose Cabinet was a Māori, senior Minister James Carroll, implemented many pioneering welfare reforms (e.g. the first country to legislate votes for women, Māori and Pakeha, 1893). New Zealand was so far ahead of the rest of the world that leading European social democrats extolled the “state experiments.” In 1900, the Liberals established a Department of Health, largely and pragmatically in response to scares about bubonic plague (spreading in Australia with several deaths occurred in Aotearoa). Almost its first action was to create a Māori Health Unit, staffed by Māori doctors, Pomare, Te Rangi Hiroa and Erihana—all of whom came

from one Taranaki village—plus others. Maui Pomare later became Minister of Health; Te Rangi Hiroa, a Yale University professor of ethnology.

A feature of these programmes was the use of Māori cultural history to communicate health messages. The community health initiatives (e.g. building latrines; upgrading housing), of the sort that became the model (independently) for the Almaty World Health Congress (1978). Community health measures are an important, but blunt, first step. They address the immediate home and village environments that have impacts on communicable diseases dependent on hygiene and sanitation: water and food borne diseases, and those affected by overcrowding.

From 1910 to 1945 Māori life expectancy had gradually improved with limited inputs from the state. Māori nursing services made some impact, but probably the greatest effects came from slowly improving living conditions, although the Turbott study (1935) and other community analyses (see Pool 1991) showed that Māori had a long way to go materially. From 1913 vital registration became compulsory, and gives indications of health conditions. By 1936, the counts for deaths, but certainly not for births, were fairly reliable, but information on causes of death was very unsatisfactory as most were not medically certified. Ironically, Dr Sir Maui Pomare, as Minister of Health was instrumental in introducing improved standards in privately owned maternity hospitals (1924), an action that benefited Pakeha but not Māori as few Māori parturitions occurred in hospital until after the Second World War.

A change of seminal importance, that affected material wellbeing very significantly, was the passage of the extremely comprehensive 1938 Social Security Act. It provided birth to grave coverage by the state for most health and other social needs, such as education, housing—Māori and Pakeha had equality in the new welfare-state. Its main impact came in the 1940s, with the introduction of a plethora of regulations and other measures enabling the act's effective implementation. As Māori health was so poor by comparison with that of Pakeha, and material wellbeing was a major determinant of this differential, they benefited from these changes. From the 1940s, therefore, two factors affecting Māori health could be addressed: the underlying socio-economic conditions, such as poor housing, and the facilitation of Māori access to modern medical institutions plus the rapidly emerging pharmacological armoury resulting from the antibiotic and chemotherapeutic revolutions dating, effectively, from the Second World War.

From 1945 to 1981. Emergence of a “Double Burden of Disease”

The wide scope and range of regulations that were introduced in the 1940s following this act had a major positive impact on Māori health, housing and general wellbeing. Moreover, the Turbott study and a paper by Norman Edson (1943) highlighted the high levels of tuberculosis among Māori. Before and after an effective anti-biotic was available Māori tuberculosis death rates were radically reduced; among Māori adults this one disease contributed 50–75 per cent of the rapid decrease in mortality occurring 1945–1961. The example of tuberculosis demonstrates the importance of socio-economic factors, as well as medical technology to control this severe disease. Throughout, the cure was in sanatoria, where bed-care and isolation, plus thoracic surgery were the instruments available. But, perhaps more importantly, under the 1938 act, tuberculosis sufferers and their families were given priority for housing, and the families' food and income supplements. The diagnosis of tuberculosis was done with a systematic and successful screening programme: 10 per cent of Māori and of persons at “risk” (e.g. nurses) were X-rayed annually mainly by using mobile X-rays. Targeting of Māori was achieved, simply but effectively, by parking X-rays in communities where Māori were heavily represented—in the late 1940s Māori were still concentrated in peripheral rural regions, Northland, East Coast and the Bay of Plenty, with dispersed but significant numbers in Waikato-Hauraki and Taranaki. Everyone who passed was filmed and those proved positive—Māori or Pakeha—were hospitalised. Immunisation against tuberculosis (BCG) was available from 1949 but used widely from 1952, and the curative streptomycin in the mid-1950s, so initially there was really “no effective cure available” (Dunsford 2008: 88, 195). The Māori decline in the 1940s must, therefore, have been driven socio-economically, by the welfare measures in the 1938 Act, but then reinforced first by expanding mobile radiographical services, and later by immunisation and streptomycin.

The successful campaign against tuberculosis plus active implementation of other regulations and measures, saw Māori mortality shift from the dominance of communicable disease to non-communicable. But, Māori increasingly became subject to a “double burden” that even affects health care in the twenty-first century: infectious causes were still disproportionately prevalent, yet by 1960 “disorders of affluence”—diabetes, cardio- and cerebrovascular diseases, obesity, and similar conditions had emerged. Levels of smoking were also much higher than for Pakeha. While the chemotherapeutic revolution, public health measures, improved housing and a mix of bio-medical and socio-economic determinants increasingly brought communicable diseases under control, non-communicable causes were also affected by cohort flows: older Māori carried forward into middle- and older-

age the “bio-medical” baggage of their younger years. In the 1940s, exposure to a range of infectious and similar disorders left impacts lasting into retirement. Some, such as that between rheumatic fever and cardiovascular risk linkages are well known; others more diffused, less specific.

The End of the Twentieth and the Early Twenty-First Centuries

From about 1980, New Zealand’s population no longer dichotomised into Māori and Pakeha, but became, for the purposes of this paper, Māori (15 % of the total) and non-Māori. Recent migrants had added to the demographic and epidemiological mix of New Zealand. By millennium’s end, Aotearoa’s people had diversified ethnically from being British-origin Europeans, plus 8–10 per cent Māori, to just under 40 per cent of the entire population being of non-European descent. Pasifika, from tropical Polynesia have disease profiles not unlike Māori; Indian sub-continent migrants a different pattern again, but with a propensity to diabetes; east and south-east Asian each different again; and the mix was further confounded by migrants from many other sources. Some were advantaged (e.g. South Africans, Europeans, Americans, whether Anglo- or Latin-), but others from poorer countries (e.g. refugees, other Africans). Because of their proportions in the total population, the ethnic mix is a major challenge for the New Zealand health system. In many developing countries, “chronic diseases [are] causing a double burden of morbidity to weigh on the population” (Gaimard 2014: 20). But developed countries with large minority groupings also face this. Indeed, this can be seen as a component of a worldwide convergence in health trends. We often forget that populations with high levels of longevity, particularly in Asia (e.g. Singapore), were high mortality developing countries until recently.

For Aotearoa we know more about health in this period because of a wave of public health papers (summarised by Woodward & Blakely 2014) mainly cause-specific, but some covering the longer-term, and socio-economic and ethnic differentials. There are also now rigorous comparisons between Māori and other indigenous minorities (e.g. Trovato 2001). Also there have been detailed analyses of health services including changing trends in hospitalisations between 1980 and 2010. For New Zealand this was a period when the health system underwent several restructuring episodes, often radical, mainly driven by neo-liberal ideology. But, there were also some attempts to make hospitals part of better organised more responsive systems that could exploit the emerging technologies defined earlier (Pool *et al.* 2009).

For Māori new issues were appearing particularly, but not entirely, for

non-communicable diseases. In part, the non-communicable causes had become dominant aspects of national policy: how to screen for the occurrence of non-communicable diseases, especially different cancers, and then effect follow-up for those diagnosed as positive. This required costly and complex health system changes. There were also the problems of coverage: were Māori (and Pasifika) as fully served as Pakeha? This was true not only for the non-communicable diseases, but also for some infectious disorders related to poor living conditions; rheumatic fever has been a continuing problem for which diagnosis is merely a first step to be followed by a long course of treatment with anti-biotics demanding visits to health providers. This issue is exacerbated for the small minority of Māori (and non-Māori) living in communities that are long distances from larger urban area with better facilities; similar situations also occur in Northern Scandinavia, outback Australia, and more remote areas (e.g. sub-Polar) in Anglo-America. For Aotearoa, the erosion of the welfare state by neo-liberal policy, including attempts to privatize segments of the social sectors (schools, health, public housing, prisons) for ideological reasons, but promulgated as a need to enforce fiscal austerity, puts further pressures on Māori families with health problems.

To add to this, there are the residual impacts of the cohort effects noted above. This shows up when data on health expectancies are linked to the real cohort (as against synthetic) patterns of life-table survivorship. Of note when comparing Māori and non-Māori, are the patterns of health expectancies in the late middle and early retirements ages and their impact on life-table survivorship (Pool 2014). The survival and health-expectations' differences between older Māori and non-Māori fit well with the cohort morbidity hypothesis of Caleb Finch and Eileen Crimmins. Higher Māori than non-Māori mortality at geriatric ages can be traced, at least in part, to the exposure to higher levels of infectious disease morbidity and "inflammations," described above, experienced by Māori when they were children in the 1930s–1950s (Yon & Crimmins 2014).

Finally, systematic primary-level screening for specific diseases, but also for overall health status, can have major positive effects. The early 2000s saw a marked increase in the referrals of men to hospitals—up till then men, especially Māori and Pasifika, had been less likely than women to present to health providers either when sick, or in terms of check-ups. By 2010, male adult hospital discharges exceeded female, especially in those health districts where attention was paid to primary-secondary/tertiary health care linkages (e.g. in New Zealand's largest metropolis, the southern part of which Māori and Pasifika are heavily over-represented) (Pool *et al.* 2009). But, unless enforced by regulations not seen in New Zealand (e.g. the withholding of benefits/schooling where children have not been vaccinated), screening

can only be successful where population-health system gaps can be overcome, especially if cultural factors intervene. Among Polynesians, including Māori, breast cancer screening encounters this, so different approaches have to be taken to encourage participation. Some commentators argue in favour of Māori providers for health and other social services. In education, this has existed since the 1970s when Māori parents pressured the government to provide Māori language pre-school and then school-services; the majority of Māori pupils attend general schools, and Māori-language schools are not exclusively Māori. Health services provided by Māori agencies have had to wait for the graduation of sufficient Māori medical practitioners to staff clinics. Today, according to Māori physician David Jansen the number of Māori medical students is proportional to their population size (Taylor & Kukutai 2015).

Conclusion

Colonization, and its post-colonial offspring, internal colonialism and neo-colonialism, have major, generally negative effects on the health and wellbeing of Native peoples. In this review, in looking at initial contact and colonization, I have considered in the main the pathogenic impacts on Māori, but one must add warfare, that seems almost a normal side-product of colonialism. By the end of the colonial period (1907), Māori were in an “underdevelopment trap.” The rest of my paper describes how Māori have gradually, but not entirely, moved out of this trap, in part because of government initiatives, but marked inequalities still exist in health and welfare between Māori and the hegemonic population.

Indigenous minorities in other developed countries did not escape the negative experiences of colonialism and post-colonialism; everywhere in these plural societies greater or lesser inequalities still exist. But, whichever situation one looks at, the formal cessation of colonial rule or the recognition of intra-country differences, did not end settler-indigenous minority gaps (I use settler loosely to include the hegemonic populations of northern Eurasia). These are real issues for the polities involved; in some minorities these seem to be “out of sight out of mind,” in others their needs are being addressed. Yet, policy initiatives are always, ultimately, at the grace and favour of the majority.

New Zealand was the last of the mid-temperate land-masses to be settled by white colonizers. The more recent experiences, of mid-latitude or mid-altitude colonization, suitable for “white settlers” have been even more tumultuous than New Zealand’s: Namibia, Zimbabwe, Zambia, Kenya, Algeria, to name examples. It is no further stretch of the imagination to extrapolate this experience to other colonized peoples, with “white settler”

minorities or not—after all, Nelson’s classic paper (1956) was addressed at the poor countries that were newly independent, or about to become so, and had often suffered the deprivation and tumult colonialism brings. Many had just fought wars of independence. Since independence, many have benefited from mass public health programmes, supplied under bi- or multi-lateral assistance, but they have also faced the neo-colonial effects of misguided health development policies under “Washington Consensus” structural adjustment regimes.

To add to this complex mix, for “settler societies” there are the impacts on health development of the residual effects of history. First, there are the ways in which colonization shaped, and continues to shape, the present. I have covered a number of these, but outstanding are the facts that indigenous minorities are generally not as advantaged as their hegemonic nationals. This is compounded by the fact that aboriginals are disproportionately represented in distant and isolated areas that are difficult to service, or concentrated to varying degrees in the poorer sections of urban areas where social capital and also health services, institutions and infrastructures are under pressures. In this era of neo-liberal and austere economic policies, the gaps between poor and rich are increasing even in the most advanced welfare states.

History has also bequeathed the effects of the epidemiological transition. In improving longevity, the health system has also become a victim of its successes. The prime causes of mortality may be “compressing,” so that proportionately more and more people die from cancers, or cardio-vascular, or cerebro-vascular disorders. But chronic non-communicable disorders are more difficult to address than acute communicable causes that typically people either die from quickly, or survive quickly. Moreover, most suffering these diseases chronically are old, and often frail. There are also the cohort effects referred to earlier, for which there are ethnic differences. Trying to accommodate these competing needs is an extra problem for the health system, a “multi-burden” extension of the “double burden” discussed earlier, with variance between ethnic groups, and typically differentiating indigenous minorities from majority populations.

Finally, while trying to cope with indigenous/non-indigenous differentials, another factor has emerged. The recent history of a number of countries with indigenous minorities, has seen large migrant and refugee waves that bring social and economic advantages to the countries concerned, but also bring their own “burdens of disease.” All of Australia, Canada, New Zealand and the United States, for example, now have large immigrant minority populations. Sweden is noteworthy for accepting refugees, and Russia has seen large in-movements from newly independent central Asian and Caucasian countries.

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