The urgent need for an equitable COVID-19 paediatric vaccine roll-out to protect tamariki Māori

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The design of COVID-19 vaccination programmes for children is currently being debated locally and overseas[1] where studies have shown that ethnic minority and Indigenous children are disproportionately experiencing severe illness and hospitalisation due to COVID-19 and so have more to benefit from a vaccine. In this editorial, we argue for a vaccination programme for all New Zealand children to be rolled-out as soon as possible after regulatory approval, and that the design of the paediatric vaccine roll-out should be underpinned by equity to uphold the Crown's obligations to Māori under Te Tiriti o Waitangi.

Current vaccination strategies have failed to achieve equitable levels of vaccination against COVID-19, with Māori currently the least vaccinated of all major ethnic groups. According to the Ministry of Health, 71.4% of eligible Māori have been administered two vaccine doses, compared to 84.2% of Pacific Peoples, >99% of Asian and 87.9% of European and other ethnicities.[2] The lower immunisation rates have already resulted in tamariki Māori and their whānau having the highest burden of COVID-19 infections. Māori represent 45% of COVID-19 cases and 36% of all hospitalised cases in the current delta outbreak despite comprising only about 16.5% of the total population.[3] As of the 28 November 2021, seven (41.2%) of the 17 deaths from the delta variant have been Māori, the highest total for any ethnic group.[4]

The COVID-19 pandemic is unfolding before a background of Māori having the worst overall health statistics of any ethnic group in Aotearoa and therefore being the most vulnerable to COVID-19 disease.[5] The long-term effects of colonisation, dispossession, systemic racism and intergenerational poverty have entrenched poor socioeconomic outcomes for Māori.[6] The failure of successive New Zealand governments to sufficiently address the drivers of inequitable health outcomes has resulted in policy that continually disadvantages Māori.[6]

The COVID-19 response will be seen to have disadvantaged Māori. Despite 250 years of differential Māori suffering in every epidemic to have arrived in Aotearoa,[7] multiple mistakes were made during the pandemic response. The government failed to design a plan specifically for Māori or to properly allow Māori to protect themselves from COVID-19, as guaranteed under Te Tiriti o Waitangi. Māori leaders' opposition to government decisions throughout the pandemic reflects inadequate consultation and a failure to reach agreement with Māori. Māori stakeholders have also been critical and opposed to the shift to the COVID-19 Protection Framework.[8] They observed that allowing individuals to cross the border from Tāmaki Makaurau and loosening the international border before Māori achieve vaccination coverage equal to the broader population would negatively and disproportionately affect the health of tamariki Māori and their whānau.[9]

It is vital that health equity for Māori is kept in mind when making decisions regarding the paediatric vaccine roll-out in Aotearoa. We must not repeat the failures that led to the existing vaccination inequities for Māori, inequities that are not a matter of chance but the result of structural racism

and inequity by design.[10] The decision to phase the vaccination roll-out according to age and diagnosed pre-existing conditions failed to account for (i) the younger age structure of the Māori population, (ii) the greater burden of Māori disease, both diagnosed and undiagnosed, at younger ages,[11] (iii) the significant barriers for Māori accessing healthcare and (iv) their justified distrust of the health system.[12]

These same factors will be present for tamariki Māori in any future paediatric vaccine roll-out. The paediatric roll-out is an opportunity to learn from previous errors and protect Māori.

The case for a vaccine roll-out for children under 12 years

Although early reports suggested that COVID-19 was a benign illness for children, subsequent studies have shown that children are at risk of harm from both the direct and indirect impacts of COVID-19 infection and the pandemic. Because evidence suggests that Māori children are at a higher risk of all harms, we argue that Māori children should be prioritised in any paediatric vaccination programme.

Direct harms to children of COVID-19 infection

COVID-19 is generally a milder illness among children in comparison with older age groups.[13] Less than 2% of symptomatic children require hospital admission,[1] and admissions in children can be brief, precautionary, for social reasons or due to parental or caregiver COVID-19 illness. An estimated 2–13% of hospitalised children require intensive care.[1] O'Driscoll et al estimated that the age-specific fatality ratio for children aged 5–9 years is approximately one death per 100,000 infections (IFR 0.001%; 95% credible interval, 0–0.001).[14] Globally, paediatric case fatality ratios differ according to context, with low- and middle-income countries reporting over 90% of the global tally of paediatric COVID-19 deaths.[15]

Deaths among healthy children due to COVID-19 are rare. However, when interpreting COVID-19 mortality statistics, the generally low mortality rate among children should be considered. Between 10 March 2020 to 10 February 2021, there were 66 COVID-19-associated deaths in 5–11-year-old children in the United States.[16] While lower than the number of deaths due to influenza and pneumonia among the same age group (n=84) over a similar period in 2019, this still placed COVID-19 among the top-ten leading causes of deaths for 5–11-year-old children.[16] Comparing COVID-19 mortality statistics with the average pre-vaccination deaths per year for other vaccine-preventable childhood viruses, including rotavirus and varicella, supports rolling-out the COVID-19 vaccine to all children.[17]

International evidence shows higher COVID-19 infection rates in Indigenous and ethnic minority children (Black, Hispanic and American Indian and Native Alaskan).[18,19] Children of racial minority groups are also more likely to be hospitalised with more-severe COVID-19.[19] Similarly, certain pre-existing conditions increase the risk of serious illness and hospitalisation due to COVID-19.[13] These are conditions that disproportionately burden tamariki Māori,[20] who are therefore expected to suffer more hospitalisations and more-severe illness as COVID-19 spreads.[21] Specific conditions associated with negative outcomes from COVID-19 infection that have higher rates in tamariki Māori include obesity, diabetes and asthma and chronic respiratory conditions.[20, 22] In a large systematic meta-analysis, one in 20 children with comorbidities experienced severe illness due to COVID-19 infection, compared to one in 500 children with no pre-existing comorbidities.[23] The risk of mortality from COVID-19 infection for children with comorbidities was almost three-times that of children with no comorbidities.[23]

Multisystem inflammatory syndrome (MIS-C), which causes fever and inflammation in multiple organ systems, is a rare and severe complication of COVID-19 infection in tamariki.[24] The incidence of MIS-C is approximately one in 3,000 infections, and the median age of incidence is 8 years.[25] Overseas, MIS-C occurs more frequently among marginalised Black, non-Black Hispanic, Pacific and Indigenous children.[25, 26]

Evidence is also emerging of persistent symptoms, such as cough, headache, fatigue, chest and abdominal pain and concentration difficulties, in children following COVID-19

infection—that is, "long-COVID."[27] However, further research is required, as the small number of studies published to date all contain major methodological limitations. In the majority of studies reviewed, symptoms did not persist longer than 12 weeks.[27] It is unclear what proportion of infected children experience long-COVID. Nonetheless, even a small proportion would be concerning since large numbers of children will continue being infected.[27] A recent preprint study of almost 12,000 children and adolescents in Germany, found that fatigue, cough and throat/chest pain were more common in children and adolescents at least three-months post COVID-19 infection compared to the control group, but persisting symptoms were less frequent among children and adolescents compared to adults. [28]

These international data raise the real concern that the direct impacts of COVID-19 infection will disproportionately affect tamariki Māori.

Indirect harms to children of COVID-19 infection and the pandemic

Because COVID-19 is generally milder in children, some say the purpose of a paediatric vaccination would be to protect adults. We argue that vaccinating children has direct benefits for children, as well as reducing risk to adults which indirectly benefits our tamariki. There is evidence that infected tamariki are less likely than adults to transmit the virus in educational settings.[29] But infected children can still transmit the virus to members of their households,[30] and if Māori children are not vaccinated to the same extent as other groups, Māori households can be expected to experience a greater number of COVID-19 infections.

This will place tamariki Māori at great risk of indirect harms, including illness, disability, hospitalisation and/or loss of a parent, caregiver, whānau member. These outcomes would result in life-long psychological, socio-emotional and socioeconomic harms. Between 1 March 2020 and 30 April 2021, an estimated 1.1 million tamariki worldwide lost a primary parent or grandparent caregiver to COVID-19,[31] and this loss is up to 4.5-times more likely to be suffered by Indigenous and ethnic minority children.[31] A study published in *Pediatrics* estimated that, between 1 April 2020 and 30 June 2021, 140,000 children in the United States lost a parent or grandparent caregiver. This study estimated one in every 753 white children lost a parent or grandparent caregiver, compared to one in 412 Hispanic children, one in 310 Black children and one in 168 Indigenous children (American Indian/Alaskan native).[31]

The wider psychosocial impacts of COVID-19, especially prolonged lockdowns, have been damaging to children. Lockdowns and periods of isolation and quarantine deprive children of enjoyment from school, friends and activities and challenge their mental health.[32] The stress of lockdowns and repeated bouts of isolation and quarantine will have life-long negative effects through the educational inequities of remote learning and family violence,[1,33,34] and if their vaccination coverage is lower, then tamariki Māori and their whānau will continue to be disproportionately affected by these burdens.

We believe that if children were asked whether they want to receive the same immunisation as their parents, protect their whānau and communities, stop the spread of COVID-19 and reduce the chance of isolation, quarantine and lockdown, their response would be an overwhelmingly positive "Yes!"

Māori sociodemographic factors favour higher transmission of COVID-19

According to the 2018 census, 32% of Māori are under 15 years of age, versus only 19.6% of the total population. Because of this younger age structure, fewer Māori are currently eligible for vaccination. According to the 2013 census, 50% of all tamariki Māori also live in the lowest three deciles on the New Zealand Index of Deprivation.[35] This places tamariki Māori at greater risk of negative health outcomes due to social, political and environmental factors, including inequities in access to healthcare,[36] inequities in access to well-resourced schooling,[37] poor-quality housing and/or housing security[38] and overcrowding and multi-generational homes.[37]

The SARS-CoV-2 delta variant is highly transmissible. In the current outbreak, the

majority of transmission is occurring within households, with the secondary attack rate estimated to be 45.6%.[39] Importantly, 20% of Māori households are classified as crowded, compared to 4% of European households.[37] Several studies have shown that vaccination reduces household transmission,[40–42] We expect the converse to be true; as the number of unvaccinated children within a household increases, the risk of household transmission of COVID-19 will increase. These factors, together with many Māori living in multi-generational homes, put tamariki Māori and their whānau at higher risk of COVID-19 from household transmission.

The emergence of new SARS-CoV-2 variants poses an ongoing risk to Māori

Globally, transmission rates for COVID-19 remain high. This increases the likelihood of the virus evolving further and of new, more-transmissible and more-severe variants emerging. For example, the SARS-CoV-2 delta variant evolved to become 97% more infectious.[39] In late November, a new "variant of concern" designated "omicron" was identified.[43,44] It will be weeks or months before we understand omicron's transmissibility and disease severity, but preliminary data from South Africa suggest that the risk of reinfection with omicron could be approximately three-times higher than for the beta and delta variants.[45] Furthermore, health officials in South Africa have reported a rapid increase in hospitalisations, including in children under the age of four.[46] The emergence of omicron and newer variants poses an ongoing risk to the health of Māori communities, especially if their vaccination coverage remains inequitable.

Inequities in healthcare predispose tamariki Māori to worse COVID-19 outcomes

International studies have shown a large decrease in healthcare utilisation for non-COVID illness in countries with large COVID-19 outbreaks. Any disruption to healthcare provision in Aotearoa would disproportionately affect tamariki Māori, given their higher burden of disease and because of multiple other systemic issues, including that Māori receive lower-quality care from the health system compared to non-Māori.[38,47]

The health system has long failed to achieve equitable outcomes from childhood immunisations for Māori, and tamariki Māori remain at significantly greater risk of immunisation-preventable diseases, including pertussis[48] and measles.[49] Although there were improvements between 2009 and 2017, those gains have since been lost. The two-year immunisation levels are 70.2% for Māori compared to 86% for New Zealand European.[50] The reasons for this lower uptake are systemic.[51] This lower immunisation rate leaves tamariki Māori vulnerable to predictable resurgences of these diseases when restrictions are lifted. Worse health outcomes for tamariki Māori from COVID-19 infection concurrent with other vaccine-preventable or seasonal respiratory illnesses are predictable.

The urgent need for an equitable paediatric COVID-19 vaccine roll-out

Paediatric vaccine decisions have been described as "more complex" given the relatively lower risk COVID-19 poses to children.[1] We argue that paediatric vaccine decisions should be made on the basis of a collective risk–benefit analysis rather than an individual framework alone. Principles of justice and equity are also compelling reasons to prioritise tamariki Māori in any paediatric vaccine roll-out. Tamariki Māori have the right to protect themselves and participate in the protection of their whānau, hapū and iwi. The principle of tino rangatiratanga derived from Te Tiriti o Waitangi supports the right of Māori to express their mana motuhake and make autonomous decisions regarding health systems for Māori. Decisions based on the needs of the general population exacerbate risks for Māori and do not comply with the principles of equity and active protection afforded to Māori by Te Tiriti.

Equity for Māori and upholding Te Tiriti o Waitangi should be central to decisions regarding vaccine approval for children under 12. Decisions regarding vaccine approval should go beyond an individual risk–benefit approach and include the wider benefits of vaccination for children, whānau and their communities. The benefits

of vaccination to all children include protection from infection, severe illness, hospitalisation and health complications. Paediatric vaccination will also protect household members from hospitalisation and death, reduce overall community transmission and avoid isolation, quarantine, school closures and other indirect harms.[1]

Planning for an equitable paediatric vaccine roll-out for all New Zealand children is an urgent priority. Colonisation left Māori in a society that has failed to protect their health historically.[52] They are less equipped to deal with disease, and their tamariki already experience a disproportionate amount of disease in New Zealand. The impacts to tamariki Māori from COVID-19 infection will not be the same as for children from affluent families living in stable housing.

Given their increased risk of hospitalisation and severe illness, tamariki Māori vaccination rates should be the prime health target for New Zealand's paediatric vaccine roll-out. It would be both inadequate and ineffective if total child population targets are used without regard to differential access for Māori. One key lesson from the adult Pfizer COVID-19 vaccine roll-out is that, to obtain high vaccination rates, we must focus on the most vulnerable and start with the hard to reach. Iwi and Māori provider partnership and resourcing should occur early to enable Māori leadership to design, develop and implement an effective vaccination programme for tamariki Māori.

What could an equitable vaccine roll out look like?

Planning for an equitable paediatric vaccine roll-out is a matter of urgency. A school-based vaccination programme would have significant benefits, such as reduced barriers to access. Because the majority of tamariki Māori are clustered in low-decile schools, a simple and obvious solution is to begin the roll-out at schools below, say, decile 4. This approach was used successfully to provide school lunches to underfed children. If Medsafe approves vaccination for 5–11-year-olds before the February 2022 school semester, a rapid school-based roll-out in partnership with iwi and Māori providers should be pursued to protect as many children as possible. Consultation with Māori as an afterthought is unacceptable.

The paediatric vaccine roll-out should also include primary healthcare vaccine sites in partnership with Māori authorities.[53] Providing paediatric vaccines at school sites, and then at primary healthcare sites, would ensure the most equitable access.[53] Substantial increases in funding and resources should be urgently allocated to Māori health providers and providers in low-decile communities well in advance to allow for recruitment of new staff and efficient planning.

This proportionate approach based on equity would prioritise Māori and provide more to those who need it most. It would not deprive anyone of healthcare and is more likely to result in an equal outcome than an approach that does not acknowledge the greater risks and barriers for Māori. Due to the existing health and socioeconomic inequities, tamariki Māori and their whānau deserve a greater share of resources to attain the same level of health enjoyed by non-Māori.

We write this editorial knowing that there has never been a national roll-out of any health intervention designed and targeted to benefit Māori. The adult COVID-19 vaccination programme, which resulted in stark inequities for Māori, is an example of the norm for health programmes in Aotearoa. Programmes that disregard the structural racism and disadvantages faced by Māori result in differential outcomes and harm. We ask those in charge of designing the paediatric vaccine roll-out to consider the principles of equity, Te Tiriti o Waitangi and social justice and to take this historic opportunity to change the direction of the last 250 years. Our tamariki deserve this.

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Nil.

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