

Appendix

Appendix Table 1: Our analysis of the coverage of health co-benefits in the Climate Change Commission Report not covered in the main text.

Potential health co-benefit of climate change action	Summary of coverage of health co-benefits	Further details and comments
Improved health from warmer and drier homes (with improved house designs and increased use of insulation)	Some mention and brief quantification	<p>The Report notes: “An evaluation of the Warm Up New Zealand programme found that the health benefits from insulating lower income households were substantial, resulting in savings in health costs of more than \$800 a year on average” (with cross referencing to published work).^{25,32} The evidence documentation also refers to a New Zealand report on gas heating and its role in mouldy homes and indoor air pollution.³³</p> <p>Comment: This is the only health co-benefit where the Report provides some quantification. Nevertheless, key published literature on the health co-benefits of improved insulation in homes^{34, 35,36} is not referred to. Also, that retrofitting insulation has a favourable cost-benefit ratio in the New Zealand setting³⁷ is not mentioned. Improved housing for Māori, Pasifika and low-income New Zealanders is also likely to reduce health inequities given the New Zealand evidence for how dampness and mould contributes to young children’s hospitalisation rates for acute respiratory infections in these groups.³⁸</p>
Mental health, injury physical health and wellbeing benefits from more compact cities and less urban sprawl (less commuting time, better access to central city services via walking and cycling)	Brief mention only	<p>Health co-benefits of urban form are considered in the Report: “Where urban form encourages cycling and walking, alongside efficient, affordable and interconnected public transport networks.” It cites work that states: “If designed appropriately, urban form and transport can increase physical activity, improve air quality, reduce road traffic injuries, increase social cohesion, and achieve maximum health benefits from services and facilities.”</p> <p>Comment: But despite the above, the health co-benefits are not explored in any further detail in the Report. This is despite the health benefits and greenhouse gas reduction benefits of active transport being modelled for New Zealand.¹⁶ There is no mention of the mental health and wellbeing benefits of reduced traffic congestion and reduced long daily commutes by private car. It is not mentioned that good design of green space can potentially ensure that urban intensification can maintain the health and wellbeing benefits of access to parks etc. Furthermore, there is the issue of how urban sprawl can exacerbate inequities. That is, Māori, Pasifika and low-income New Zealanders can be forced to the periphery of urban areas where rents/house prices are lower, but then face greater commuting costs and poorer access to public services. Finally, more compact cities would facilitate a mode shift to more active transport and public transport and evidence suggests that such a mode shift also reduces overall road traffic injury risk and deaths.³⁹</p>

Appendix Table 1: Our analysis of the coverage of health co-benefits in the Climate Change Commission Report not covered in the main text (continued).

Potential health co-benefit of climate change action	Summary of coverage of health co-benefits	Further details and comments
Improved mental health and cardiovascular health from reduced noise pollution (as a result of decreased private vehicle use, increased use of rail and shipping for freight and any reduction in air transport)	Very brief mention	The Report mentions this potential benefit in brief and general terms (eg, “quieter streets”). Comment: There is a marked lack of detail in the Report. There is no mention of the evidence that suggests that exposure to traffic noise is associated with mental health and cardiovascular problems (depression, high blood pressure, myocardial infarction, heart failure and stroke in adults, hyperactivity/inattention and “total difficulties” in children and adolescents). ⁴⁰⁻⁴³ Health inequities could also be reduced as Māori, Pasifika and people on low incomes are more likely to live in noisy areas (eg, near arterial roads and airports).
Improved water quality from increased reforestation and livestock reductions (reducing nitrates and enteric pathogens from livestock agriculture)	Very brief mention	The Report mentions “cleaner water” as a potential benefit of reforestation and mentions the issue of “pathogen loss into waterways.” The Report also considers reduced livestock numbers and reduced land used for livestock farming as options, and these would also be likely to reduce water pollution. Comment: Enteric pathogen contamination of waterways is an important issue in New Zealand as indicated by a major water-borne outbreak of <i>Campylobacter</i> infection in Havelock North. ⁴⁴ The water contamination issue has also been considered in the context of giardiasis. ⁴⁵ Nitrate pollution of water is also a likely risk factor for colorectal cancer, ^{46,47} as well as emerging evidence of it being a risk factor for birth defects and other cancers. ⁴⁸
Other reduced health harm and water treatment costs arising from increased reforestation	Briefly implied	The Report notes that establishing new native forests on less productive land offers erosion control benefits. Comment: But the Report fails to draw linkages with reforestation and: (i) lower risk of flooding; (ii) lower water treatment costs.