Being Bolder – Public Health Endgames for NZ

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Southern saltmarsh mosquito: A disease vector successfully eliminated from NZ

At the Public Health Congress in Auckland last week, one of us presented on potential public health endgames – partly to inform thinking around the tobacco endgame in New Zealand (the Smokefree Nation Goal for 2025). This blog post provides a brief historical perspective and international perspective on public health-related endgames. It also considers what additional endgames this country could be bolder about tackling.

Examples of successful endgames internationally

Thus far, only two infectious diseases have been eradicated globally: smallpox (with the declaration in 1980) and the cattle disease “rinderpest” in 2011 (with this disease once threatening the livelihood and food security of millions of people in the Middle East, Africa and Asia). Such endgames can be highly valued as they can permanently eliminate health hazards and save costs (i.e., no more treatment costs or need for smallpox vaccination).

A few other diseases are on the cusp of global eradication. For polio it is just three countries to go (Nigeria, Afghanistan and Pakistan) – albeit with some recent difficulties, including vaccinators being killed in conflict zones. For Guinea worm disease there are just five countries to go, with 180 countries now certified free.

Other country level elimination successes include:

- Yaws – eliminated in many countries including India and if global eradication is achieved by WHO's target year of 2020, it will become the first disease to be eradicated through the use of antibiotics
- Malaria – eliminated in 25+ countries
- Lymphatic filariasis – eliminated in 20+ countries
- Measles – eliminated in Americas region of WHO (2002), but imported cases are still a problem
- Rubella – nil since 2009 in the Americas
- Onchocerciasis (river blindness) – Colombia (2013)

One of the most successful treaties ever has been the Montreal Protocol which resulted in the phase-out of the production of ozone layer-damaging chlorofluorocarbons (CFCs). Elimination of various toxic chemicals is also covered by the *Stockholm Convention on Persistent Organic Pollutants (POPS)*. In terms of weapons there has also been the elimination of all stockpiles of landmines in 87 countries (the Ottawa Treaty), the probable end to all biological weapons programmes (the Biological Weapons Convention), and the 100% elimination of chemical weapon stockpiles in 4 out of 9 states so far (the Chemical Weapons Convention).

Past: Endgame successes in NZ

As of 2014, NZ has successfully eliminated three infectious diseases that were previously well established here: polio, hydatids, and brucellosis (see this article). It also spent over $70 million dollars eliminating the southern saltmarsh mosquito from sites around the coast (this insect is a vector for Ross River Fever). In terms of other public health-related hazards, NZ has also:

- Phased-out leaded petrol (achieved in 1996 – see here for the prolonged saga)
- Banned DDT (in 1989) and ratified the *Stockholm Convention on POPs* (in 2004)
- Banned imports of certain dangerous dog breeds (e.g., American Pit Bull Terrier)
- Banned certain asbestos imports (1984)
- Banned visits by nuclear-armed/powered naval vessels (law in 1987)
- Eliminated exotic mammalian pest species from 100+ offshore islands (including mice, rats, cats, possums, goats, pigs and deer). Some of these species are disease vectors e.g., for bovine tuberculosis. NZ experts are recognised as world leaders in island-level pest elimination.

Present: Current endgame planning in NZ

At present the NZ Government has signed up to national measles elimination as part of a regional initiative of the WHO. Due to increasing immunisation coverage progress is being made (i.e., there were only 8 notified cases in NZ in 2013). The other major endgame goal is for a "Smokefree Nation" by 2025. However, modelling work suggests that this goal will not be achieved in terms of business-as-usual tobacco control activities (van der Deen et al in press with the *NZMJ*), or from outlet reduction (see also this blog post), or from raising tobacco taxes. So novel interventions are probably required (e.g., phasing down the nicotine levels in tobacco).

Future: Potential for further endgames in NZ?

So what could be added to this list? The infectious disease possibilities are:

1. Mumps and rubella with respectively only 23 and 1 notified cases in 2013. If we achieve the elimination of local measles transmission with high coverage of MMR vaccination it will probably phase out these diseases as well. (Though occasional imported cases will occur until global eradication is achieved).
2. Hib disease – since we are nearly there with only 2 cases notified in 2013. This disease can be eliminated if high immunisation levels are achieved (e.g., it has been eliminated in Iceland).
3. Campylobacter infection from fresh poultry. There has been substantial progress with controlling infection from this source (see this article). But the government would need to tighten the regulations around contamination levels further and require freezing of all product that is still contaminated, before it can be sold.
4. Rotavirus infection – this might be feasible given routine use of rotavirus vaccination in children has been recently introduced (but animal reservoirs might limit this goal to children residing in urban areas).

But what about other public health-related endgames for NZ – beyond infectious diseases?

5. "Vision Zero" is a strategy to eliminate all **road traffic fatalities** which has been adopted for Sweden for 2020 (and subsequently by Norway, San Francisco and New York City). But we doubt this would be currently cost-effective for NZ – given the quality of our roads and cars relative to these richer countries.
6. Elimination of **scalding** from hot water cylinders might be more feasible. A law requiring thermostats to be pre-set at an unalterable safe maximum temperature at the factory would help to achieve this. So would home visits to check water temperature in homes with young children.
7. Eliminating **coal/gas-generated electricity** in NZ. This would help the country meet its international obligations for reducing greenhouse gases (and have health co-benefits for NZ such as from reduced air pollution).
8. Eliminating **unflued gas heaters** to reduce indoor air pollution (e.g., these are banned in Canada, and some US and Australian states).
9. Eliminating **direct-to-consumer-advertising** of prescription pharmaceuticals (banned in all countries except NZ and the US).
10. Eliminating the most **hazardous forms of gambling** e.g., poker machines (banned in 5 US states including Hawaii and Connecticut), casinos (e.g., eliminated in Turkey), and online gambling (e.g., banned in the Netherlands).

Conclusions

As of 2014, New Zealand has achieved various successful endgames, including: polio, hydatids, brucellosis, leaded petrol, DDT, pests on islands, exotic mosquitoes, and nuclear-armed ships. But currently it only has a very limited number of official endgame goals (e.g., eradicating measles and achieving a smokefree nation by 2025). Furthermore, from other endgame successes we have learnt that well-coordinated action/planning is required to achieve such endgame goals – and these seem to be lacking at present, especially with the smokefree nation by 2025 goal. A larger list of other plausible endgames could be considered (as outlined above) and these could benefit from focused research to assess the feasibility and cost-effectiveness of the elimination option. While it is good for NZ to make incremental improvements to health in a wide range of areas – it may still be good to be a

bit bolder in striving for more single issue endgame successes.

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