



The \$200 million decision for New Zealand's Meningococcal Vaccine Strategy

On 10 December 2001, Jane O'Hallahan from the New Zealand Ministry of Health was waiting outside the Cabinet room, where Government was considering a paper asking it to spend up to \$200 million and share a significant risk with an overseas, private sector partner. A new vaccine was needed to protect New Zealand children against a unique strain of group B meningococcal disease. It would be the single biggest public health expenditure ever made in New Zealand, and would have to be funded outside the regular Health budget. The proposed vaccine did not yet exist and might even fail to be developed; over 3 million doses would have to be produced and delivered in a fraction of the normal time needed to bring a vaccine to market. The Ministry had already signed a preliminary contract with the chosen manufacturer, Chiron Corporation, subject to Cabinet's decision on funding. O'Hallahan, leader of the Meningococcal Vaccine Strategy team, had spent most of the past year building support for this bid. She was prepared for some searching questions.

The cost and benefit of a new vaccine

In March 2001, Chiron Corporation was chosen to develop the vaccine needed to combat the epidemic that was having a devastating impact on New Zealand children, and for which no ready-made vaccine was available. Experts in the disease and in vaccinology had made the selection of manufacturer, leaving the Ministry to negotiate final costing details. On 20 July 2001, the Ministry and Chiron signed a preliminary contract, using funding already set aside for vaccine trials, to enable early development work to proceed. If funds were approved, the target for delivering the first vaccinations was 2003 and the epidemic should be ended by 2006.

From the outset, the vaccine strategy team had been faced with finding a way to fund a product that did not exist, and, as a biological product, might not develop in a predictable way. The

This case was written by Janet Tyson, Australia and New Zealand School of Government, for Dr George Argyrous, University of New South Wales, as a basis for class discussion rather than to illustrate either effective or ineffective handling of a managerial situation. It has been adapted from Chapters 13 and 14 of the book *Fighting a Fearful Disease: controlling New Zealand's meningococcal B epidemic*, published in association with ANZSOG by the Institute of Policy Studies, Victoria University of Wellington www.ips.ac.nz. ANZSOG cases 2006-18.1 and 2006 18.2 "New Zealand's Meningococcal Vaccine Strategy" deal with other aspects of this topic.

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Ministry was asking the Government to take a major risk at a time when, following the Cave Creek tragedy¹, the public sector was very risk-averse.

“In an evidence-based policy environment, funding follows proven results,” policy analyst and strategy team member Robbie Lane said. Lane, who prepared the paper to Cabinet, would spend many hours in discussion with The Treasury during 2001. “Under section 59 of the Public Finance Act 1989, we can’t get funding for nothing. But we couldn’t go into negotiations without some funding. We had to find a way to remove some of the risk for the government.”

Without having the full details, the strategy team knew it would be looking for well over \$100 million to fund the vaccine development and delivery.

It would be essential to show Cabinet the value it would get for its investment. The strategy team had the cost–benefit analysis already developed by Associate Professor Richard Milne at the University of Auckland.²

This research showed that, despite the best medical interventions available, without a preventive vaccine the New Zealand health sector would face current and future treatment and rehabilitative costs of \$300 million. The corresponding costs to society in general would be \$630 million. However, when set against the threshold used by the government’s Pharmaceutical Management Agency (Pharmac) in deciding whether to fund new medications, the vaccine was only “moderately” effective.

Jane O’Hallahan and her team saw this as a starting point in the development of a policy. The art of the effective policy writer is to advance an argument that clearly signals and provides supporting evidence for a preferred course of action.

Complex and unquantifiable factors

“Setting public policy always entails an element of political choice, and this programme was no exception,” she said. “You don’t necessarily pick the most cost–effective option. Other things are also important. We take into account fairness and overcoming inequalities.” This meant several complex and unquantifiable factors must also be considered.

Figures could be calculated for ongoing costs to the health system but these had to be weighed against intangibles like the community’s very real fear about the disease. For every “hard” factor like efficiency or effectiveness to be used in framing a decision there was at least one “soft” factor such as ethical considerations.

“We had an emergency in that New Zealand’s rates were far in excess of other countries’ rates for this group B meningococcal disease,” O’Hallahan said (*see Exhibit A*). “We modelled that the epidemic was likely to continue for at least another 10 years without intervention. Ten cases were occurring every week in 2001. It was New Zealand’s most feared infectious disease. In terms of addressing inequalities, there were very high rates in Māori and Pacific people.”

¹ In April 1995, 14 young people had died following the collapse of a viewing platform, built by the Department of Conservation, at Cave Creek, on the South Island’s West Coast.

² R. J. Milne, J. Evers, T. Ashton and D. Lennon (2001) ‘An economic evaluation of vaccination against meningococcal disease’, released by the Ministry of Health under the Official Information Act 1982.

Thirty-four percent of cases occurred in people of Pacific descent, who made up 6 percent of the population; 29 percent of cases occurred in Maori, who were 15 percent of the population. Half of all cases occurred in children under five, with babies under one year old most vulnerable of all.

In seeking funding outside the existing health budget, the vaccine proposal would compete against other urgent projects the government might be considering for special appropriations. One current issue was the biosecurity need to combat the rapidly spreading infestation of the painted apple moth.³ Other issues were rising rural discontent at poor telecommunications services and urban unhappiness with slow progress in getting high-speed internet access.

Extensive consultation

For projects with major fiscal impact, the New Zealand system requires extensive consultation within the department preparing the Cabinet paper and with a range of external stakeholders. The Ministry of Health's *Memorandum to Cabinet Health and Education Committee: Request for Group B Meningococcal Vaccination Campaign Funding Proposal* went out for consultation with other agencies in August 2001.⁴

By then the vaccine strategy team had already put in many hours to build their case. On the advice of a long-time campaigner for the vaccine, O'Hallahan took with her pictures of survivors, like little Hayley, the baby girl from Gisborne whose face had been ravaged by the disease. Her grieving parents gave permission for her picture to be used in advocating for the vaccine.

"Show those young men at The Treasury who will make the decisions just what it means when a child gets meningococcal disease," O'Hallahan was told. "You will be talking to guys just out of university. They're not married, they haven't any children and all they can measure disease by is how many deaths. We've got huge disease rates but a low death rate. All those things they measure by are useless unless they see the true picture."

For the Ministry of Health's Deputy Director-General, Don Matheson, the overall picture of the misery being caused by the disease, and its focus on the smallest and most vulnerable members of society, made the most powerful argument. "This was clearly something we couldn't, as humans, not respond to." As the person who had to make strategic decisions about all public health dollars, he was well aware of competing priorities. But meningococcal disease was the purest example of the "rule of rescue"⁵ that he had ever seen.

"There are some circumstances where you are bound, as a human being, to take action, regardless of what priorities have already been established. Meningococcal disease was one of them. A vaccine was the 'easiest' way to tackle the problem; dealing with poverty and poor housing would also be effective but would be much more complex. I felt the government should be doing both."

³ The painted apple moth threatened New Zealand's native and plantation forests. It was eventually eradicated after a \$90 million campaign.

⁴ Eleven different government agencies, from the Office of the Commissioner for Children to the Ministry of Foreign Affairs and Trade, were consulted on the paper. The Ministry for Pacific Island Affairs and Te Puni Kōkiri (Ministry for Māori Development) asked for more detail.

⁵ J. Richardson and J. McKie (2000) *The Rule of Rescue* working paper 112, Melbourne: Centre for Health Program Evaluation.

When O’Hallahan went to speak with the Treasurer and Deputy Prime Minister, Dr Michael Cullen, she took colour pictures of affected children. She also took the graph comparing Norway’s earlier epidemic of group B meningococcal disease with New Zealand’s current situation (*Exhibit B*). The Norwegian epidemic was caused by a related, but not identical strain of the disease, and data on the strain-specific vaccine developed in Norway would give manufacturers a head start. For New Zealand to get benefit from a vaccine, it would have to be developed in a fraction of the 12–15 years usually needed.

Treasury asks for options

Of all the government departments consulted, The Treasury showed the greatest interest. Lane, while preparing the paper to Cabinet, spent many hours in discussion with a Treasury representative. His advice was to be very clear about identifying expected benefits from the government’s investment.

The ministry’s original recommendation was in line with the World Health Organization’s expert opinion that the mass immunisation of people in a broad age band had the greatest potential to wipe out the epidemic. The government should purchase enough vaccine to deliver three doses to all under-20s.

“Treasury, after discussions with the Department of Prime Minister and Cabinet, asked us to go back and cost two alternate scenarios which were based on a population of risk”, Lane said. “That’s unusual. Cabinet usually wants one estimate. We eventually offered three possible scenarios.” (*See also Exhibit C*).

The three other listed options were to immunise all:

- under-20s, nationally
- under-5s, nationally, plus 5–15-years-olds in Auckland, Rotorua and the Eastern Bay of Plenty, and 5–19-year-olds in Northland (which meant immunising where disease rates were 63 per 100,000 people or more)
- under-5s, nationally.

There was also, at The Treasury’s request, the “status quo” option of letting the disease take its natural course, without a vaccine intervention.

Costs and obligations

“We went back and costed each option, and extended the original economic analysis done by Auckland University. The paper also showed the savings that the health system could expect from each option,”⁶ Lane said. They used both cost per quality-adjusted life years and net present value. “All of these options were assessed in their relation to cost, acceptability and affordability and in relation to Treaty of Waitangi obligations.”⁷

There would be hidden costs, O’Hallahan felt, in the partial immunisation options. She could see the public might have difficulty accepting that not everyone was eligible.

⁶ Figures for each option are confidential and have been removed from Cabinet Minute (01) 38/20, which was released under the Official Information Act 1982 and is the source of information here.

⁷ The Treaty of Waitangi, signed in 1840, is regarded as New Zealand’s founding document, defining the relationship between Maori and the British Crown, with 62 Acts of Parliament currently requiring reference to the principles of the Treaty.

O'Hallahan pinned her hopes on what she felt was a very robust case for mass vaccination. "There was detailed cost-benefit analysis. We made assumptions about how much protection the vaccine would give, how many children we could immunise, and how many cases would be prevented. But there was a lot of thought and sound data behind them."

Lane said, "Critical for us was that obligations are not just based on economic efficiency. There were also the other obligations that we had about fairness, Treaty of Waitangi obligations. A whole range of details formed the policy mix."

This was a disease around which there was a high level of fear. The Cabinet paper also referred to the argument about the rule of rescue.⁸ "As a developed country, if there is the possibility of preventing a devastating epidemic, it does behove a government to do something. Not totally despite the cost, but even if it is a high cost, it should be carefully considered," O'Hallahan said.

As December 2001 approached, it was already clear that it would be the worst year yet for the New Zealand epidemic of group B meningococcal disease. At an average 17.4 cases per 100,000 people, the infection rate was well above rates currently being experienced in other developed countries (*see Exhibit A*). Case numbers were climbing to 650, and there had been 26 deaths. Unusually, case numbers began to build from the middle of the year, and kept on growing when they would normally be tapering off as summer arrived.

A solution we can deliver

As O'Hallahan argued, while a strong case could be made for some alternative health interventions to stop the epidemic, "Here we have a solution we can deliver. Even if you could relieve all the problems of poverty and poor housing you could not entirely deal with meningococcal disease. It goes across ethnic and social groups."

On 10 December 2001, the Cabinet had the final paper to consider: "The continuing meningococcal B epidemic is a national public health emergency. Meningococcal disease can strike very rapidly and may result in death, loss of limbs, deafness, brain damage, and may require major skin grafts. This is a disease that has extraordinary rates in Pacific and Māori communities, but is extremely high for all New Zealanders. The rate of meningococcal disease in New Zealand is nine times higher than in other developed countries."

The paper asked for funding "up to \$200,000,000" for New Zealand's tailor-made vaccine. This was an amount almost equal to the annual allocation for all public health expenditure (\$220 million in 2001/02), or over 3 percent of the whole Health budget (\$7.4 billion.) It represented nearly 40 percent of the annual community medicine allocation of \$565 million administered by the drug-purchasing agency Pharmac.

All three vaccine purchase scenarios were included in the paper, along with The Treasury's recommendation that, on the basis of economic criteria required for other health spending, such as that used by Pharmac, funding would be better spent on other social interventions. If any option was to proceed, it should be the least expensive, targeting only children under 5 years. However, The Treasury, which commended the cost-benefit analysis in the paper, acknowledged that if intangible benefits such as potential herd immunity⁹ and the reduced fear of

⁸ Ministry of Health (2001) 'Memorandum to Cabinet Health and Education Committee: request for group B meningococcal vaccination campaign funding', Cabinet Minute CAB Min (01) 38/20, December, version available through the Ministry of Health under the Official Information Act 1982, p. 3.

⁹ Herd immunity occurs when a vaccine eliminates sources of infection in the population as well as protecting those vulnerable to infection.

disease in the population were deemed to be very high, then the tabled calculations “significantly understate the true benefit of the investment”.

At its 10 December 2001 meeting, the Cabinet would have to make a number of judgments about the evidence presented for and against vaccination: could it justify spending such a large amount of money on one of many competing social needs and possible health interventions; what impact was imposed by its obligation to Maori under the Treaty of Waitangi; how should it incorporate wider concerns about equity exposed by studies showing the links between poverty, crowded housing, and meningococcal disease;¹⁰ how should non-measurable costs and benefits be accounted for; and what were the hidden assumptions behind the different positions.

As the Cabinet met, O’Hallahan hurried back to Wellington from a Meningococcal Management Team meeting in Auckland. She wanted to be on hand for questions or clarification.

She wasn’t needed. The decision was made in 15 minutes.

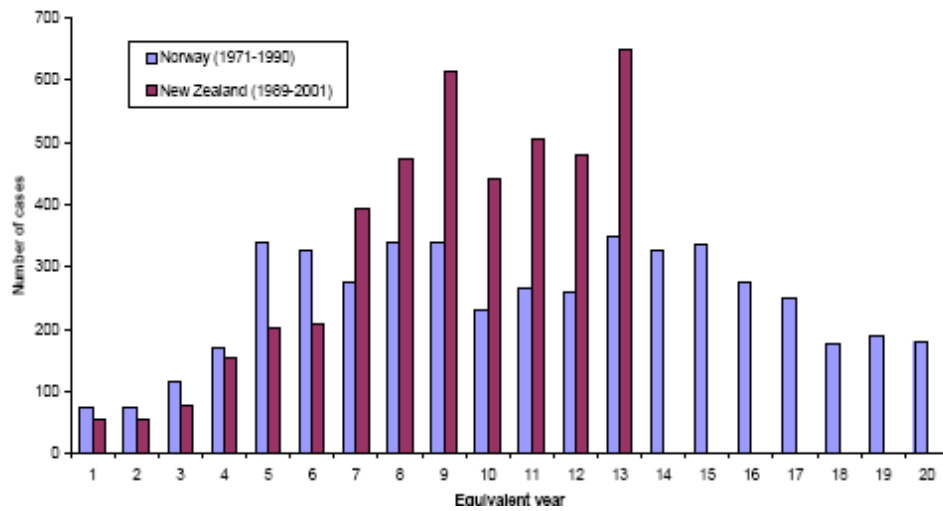
¹⁰ M.Baker et al, (2000) “Household crowding a major risk factor for epidemic meningococcal disease in Auckland children” *Pediatric Infectious Disease Journal*, 19 (10) pp 983-990.

Exhibit A: International comparison of rates per 100,000 people of meningococcal disease, 2001

Country	Rate per 100,000
New Zealand	17.4
Ireland	5.2
Scotland	5.0
Australia	3.5
Denmark	3.1
England/Wales	2.0
Norway	1.7
Germany	1.0
Finland	1.0
Sweden	0.9
Canada	0.8
United States	0.8

Source: Derived from R. Lane (2005) 'The Meningococcal Vaccine Strategy: complexities of policy prioritisation and implementation', presentation at the Friday seminar series at Wellington School of Medicine, 18 March.

Exhibit B: Meningococcal disease cases, Norway (1971–1990) and New Zealand (1989–2001)



Source: D. Martin, R. McDowell, N. Garrett and M. Baker (2002) *The Epidemiology of Meningococcal Disease in New Zealand in 2001* report prepared for the Ministry of Health by the Institute of Environmental Science and Research, Wellington: Ministry of Health, Figure 6, p. 13.

Exhibit C: Summary of vaccine purchase options

Criterion	Under-20s	All under-5s plus high-risk under20s	All under-5s
Target population	1,224,140	595,029	342,600
Rate of disease	36 per 100,000	5-year aggregate rate 63 per 100,000 to 100 per 100,000	86 per 100,000
Epidemic control	Proven (in Cuba)	Partial	Partial
Public perception	Probably positive	Some children at moderate risk likely to contract disease	Misses out other age cohorts with high disease rates
Risks		Pressure to expand programme	Pressure to expand programme
Expected health benefit over 5 years of programme	+1,825 quality-adjusted life years	+1,567 quality-adjusted life years	+1,279 quality-adjusted life years
Cost-effectiveness versus New Zealand benchmarks/alternative health investments	Moderately expensive	Relatively cost-effective	Relatively cost-effective
Equity	Equal access all at risk; reduces Māori and Pacific inequality	Equal access all high-risk; no access moderate risk; Pacific and Māori benefit	Equal access all high-risk; no access moderate risk; Pacific and Māori benefit
Cases averted over 10 years*	2490 cases averted, 136 deaths averted	2140 cases averted, 115 deaths averted	1780 cases averted, 95 deaths averted
Expected net present cost savings to the public health system	\$98 million (discounted at 5%)	\$87 million	\$70 million

* Assuming 85 percent reduction in disease incidence nationally after 3 years.

Source: Summarised from Ministry of Health (2001) 'Memorandum to Cabinet Health and Education Committee: request for group B meningococcal vaccination campaign funding', Cabinet Minute CAB Min (01) 38/20, December, version available through the Ministry of Health under the Official Information Act 1982.