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Overcoming Challenges to New Zealand Public Sector Risk Management

Abstract

Risk management in New Zealand's public sector is challenging. The development of proactive, well-informed strategies that bear on risks affecting public policy has obstacles to overcome. The challenges include complexity, uncertainty, heuristic biases, policy debates over the role of government, and how the polity should determine and articulate risk appetites and tolerances. Overcoming these challenges is important. Effective risk management enhances policy resilience and adaptability during crises, whereas poor practices result in inadequate outcomes and missed opportunities for improvement. This article emphasises the need for probabilistic analysis, institutional checks, anticipatory governance and continuous improvement to overcome these challenges. It warns of common traps public servants often fall into.

Keywords risk management, probabilistic models, uncertainty, governance, resilience, policy adaptability

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Risk management done well is worlds away from risk management done badly. Done well, risk management considers the impact of all types of uncertainties that may affect public policies, and proactively puts in place cost-effective mitigations (see Table 1). Decisions to avoid, control, transfer and accept risk are well-informed and under constant review. When shocks or disasters happen, robustness and redundancy in public policy delivery systems absorb much of the impact, and the readiness of public policy to respond and recover means we quickly adapt and thrive.

Done badly, managers' compliance with requirements to maintain risk registers is used to justify previous decisions. Decisions to avoid, control, transfer and accept risk are implicit and of lower importance than public policy development. Risk management is reactive, as public sector organisations scramble to respond to and recover from shocks and disasters. Reviews of what went wrong tend to focus on structural or organisation changes: 'rearranging the deck chairs on the Titanic'.

Table 1: Contrasting good and poor risk management

	Good risk management	Poor risk management
Approach to uncertainty	Proactively considers all uncertainties affecting public policies and implements cost-effective mitigations.	Reactively addresses issues as they arise, often scrambling to respond to shocks and disasters.
Decision- making	Decisions to avoid, control, transfer or accept risks are well-informed and kept updated.	Risk-related decisions are implicit, poorly prioritised, and used merely to justify prior actions.
Preparation and response	Public policy delivery systems have built-in robustness, redundancy, and readiness to quickly adapt and recover from shocks.	Inadequate preparation leads to structural or organisational changes that overlook root causes of poor outcomes.
Use of rules and frameworks	Avoids heuristic biases, employs probability analyses, and maintains institutional checks and balances for sound risk management.	Relies on lazy thinking and defaults to inappropriate decisions or actions during crises.
Governance and strategy	Proactively utilises anticipatory governance structures, ensuring sound policy implementation and risk control.	Focuses on superficial structural changes, often described as 'rearranging the deck chairs on the Titanic'.
Continuous improvement	Committed to ongoing efforts aimed at minimising risk impacts and enhancing strategy effectiveness.	Neglects recommendations from past reviews, repeatedly failing to implement known solutions.

There are examples of both good and bad risk management in the New Zealand public sector, but there is a worryingly large amount of bad. Good risk management is much, much harder than bad risk management. Complexity, uncertainty, heuristic biases, debates about the role of government, the challenges of articulating risk appetites and tolerances and the challenges of developing appropriate responses all get in the way of good risk management.

Recognising these challenges and facing up to them can go a long way towards improving risk management. Good institutions – rules, frameworks and operating procedures – are available to help overcome these challenges and engage in good-quality risk management so that objectives are more likely to be achieved, despite inevitable uncertainties.

The challenge of complexity

Determining probabilities and risks is an area where intuition often lets us down. If we are asked, for example, how many people are needed in a room for it to be likely (probable) that one person shares a birthday with another, most people would not have the maths skill to work that out. They would need to guess, and my guess is they would come to a number higher than 23, which is the number a statistician or actuary would provide.

The human mind is not well equipped to deal with problems involving exponential equations. The chance of tossing a coin and getting heads 10 times in a row is 0.5^{10} or about one in a thousand, a much larger number than many would guess.

But judgements about uncertainty are necessary for any public policy manager. How much unreported crime is there? How many false positives and false negatives can be expected in repeated application of public policy? How much volatility can be expected in forecasts? What is the likelihood of a multi-billion-dollar natural disaster in the next ten years? The uncertainty inherent in all these questions cannot be measured well intuitively, but can be measured in probabilistic models. These probabilistic models can be used and, importantly, can be improved over time as evidence emerges and provides feedback on their performance.

The intuitive approach to measuring risks is a heat map, often touted as a way to clearly present the importance of a risk, but this is a poor solution. Heat maps are a simple diagram, with one axis showing probability, the other showing consequence. One corner of the heat map, where both consequence and probability are low, is coloured green, the opposite corner is coloured red, and there are different shades of amber in-between. If a picture tells a thousand words, then heat maps should surely be a great way to depict a risk.

Alas, our intuition lets us down. For any hazard there will be circumstances where an event will have low consequences and circumstances where an event will have higher consequences. A risk is a line on a chart, not a point, and to depict it as a point is misleading. Furthermore, without numbers, it's likely that risks will always sit where they always have on the heat map despite their dynamic nature. Rather than providing information, risk maps either mess up what is known, or they hide ignorance about the risk (e.g., tipping points, cascading and compounding risks, etc.). They implicitly condone ignorance.

For example, tipping points are a well-known phenomenon since Malcolm Gladwell's popular book on the subject (Gladwell, 2002). A tipping point is a moment of critical mass or threshold when societal transformations occur, and it is not possible to 'go back'. With climate science in particular, a tipping point is a critical threshold that, when crossed, leads to large, accelerating and often irreversible changes in the climate system that, if crossed, will have severe impacts on human society. A number of global tipping points have been identified, and there is significant research into the possible impacts. The risks of crossing tipping points are real, almost impossible to predict, and underappreciated. Overuse of heat maps permits this lack of attention to continue.

If the craving for coloured charts can't be overcome, a better approach is to develop burning embers diagrams developed by the Intergovernmental Panel on Climate Change (Zommers et al., 2020) that make use of probabilistic analysis.

The better solution is to embrace the complexity rather than hide from it. Non-quants (quantitative analysts) should be humble about their ability to measure risk and probability and be eager to employ quants to assist them. It is easy to acknowledge that you may not know the probability that two people in a room full of people share a birthday, but it is also easy to acknowledge that there is an answer to that question and that an actuary will be able to provide it. Probabilistic analysis can be applied to many public policy and

management issues; almost anywhere there is uncertainty, an easy gain to improve risk management is to demand probabilistic analysis, to make use of people skilled in mathematics.[1]

The fun part comes from being a challenging customer of the services of quants. It is possible to look closely and question them on the assumptions they employ. It is possible to apply Bayes' theorem, even if that theorem is not fully understood. Named after 18th-century British mathematician Thomas Bayes, this theorem provides a way of determining the likelihood of an outcome occurring based on a previous outcome in similar circumstances (conditional probability). What is great about Bayes' theorem is that it provides a way to revise existing predictions or theories (update probabilities) given new or additional evidence. It incentivises questions about what new evidence is available, and how that affects things. Risk maps tend to have the opposite effect.

Probabilistic analysis is important because it enables the impact of risk management to be measured. Without it, there is no easy answer to the question: is risk management working? Without it, when the sailing appears smooth, you simply don't know if you are lucky or smart.

That provides the first way to improve risk management and meet the challenge of complexity: check whether probabilistic analysis can be brought to risk analysis, and balance that with being a demanding customer for quants providing that analysis.

The challenge of uncertainty

Usually, the value of information is that it reduces uncertainty. Measurement and assessment provide information and that information provides us with greater assurance in our decision-making. Risk, however, is best defined as 'the effect of uncertainty on objectives, whether positive or negative' (International Organization for Standardisation, 2009). Measuring risk does not, therefore, reduce uncertainty. Rather, it provides greater certainty about our uncertainty. This is still useful, but it is a step removed from its usual function.

The axiom that what gets measured, gets managed is not true. What is more likely to be true is that what is not measured is not managed. So, the nature of risk, and the fact that risk has uncertainty at its core, creates two challenges for those who want to manage risk well. The first is the propensity to undervalue the importance of risk measurement, because, unlike the usual case, measurement does not directly reduce uncertainty in risk management decision-making. The second challenge is to avoid falsely believing that by measuring risk, the risk is reduced, because there is now greater certainty, and therefore less risk.

How best to respond to those challenges? Again, the first and most important step is to be aware of them. Essentially, they represent lazy thinking. Risk measurement is vital in making an assessment as to whether a risk is above your risk tolerance or is under your risk appetite. While there is inevitably still uncertainty about that assessment – for example, whether a planned course of action is too risky – risk measurement will still enable a more accurate assessment of that riskiness. It is doing its job.

The second part of rising to this challenge is simply to recognise that risk management involves actions to avoid, control, transfer or accept the risk. These are the true ways to manage risk. Risk measurement informs us in making those decisions; it does not substitute for them. Writing up a risk register and then sitting back and admiring that work is not risk management.

The challenge of heuristic biases

Individual perceptions and biases affect views on risk tolerability and desired resilience. Cognitive biases influence our decision-making processes.[2] Risks are mostly viewed through the lens of emotions and intuitive reactions, as opposed to applying a strict technical assessment of likelihood and consequence.

These heuristic biases are generally a good thing: a speedy decision for fight or flight without resorting to analysis testing out the pros and cons of either action has probably been influential in saving the human species. Without an optimism bias, we might all be nervous wrecks; without myopia and short-term thinking, we might not give the here and now its due attention; without a bias for group think and herding, collaboration and co-operation would be made a lot harder.

Unfortunately, proactive risk management is about anticipating things that may not happen in the future and doing things now to make us more resilient to them. These intertemporal asymmetries, when costs hit sooner and are more certain, direct and visible than the longer-term benefits from resilience, are not an area where our heuristic biases – or our political systems – serve us well.

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An excellent economist, who spent most of his career working for the Reserve Bank and the Treasury, once confided in me that, having retired and started contributing more to community and non-profit organisations, he had come to the view that economists think differently from 'normal' people. When faced with an opportunity, he naturally considered the opportunity cost. Only by comparing the opportunity with the costs of alternatives could he be sure he was allocating limited resources wisely. He observed that what came naturally to him seemed to be unnatural to others. For most people, if an opportunity presented itself, and looked to improve things, then it was worth grabbing.

As with opportunities, so with risks. The risk of not mitigating needs to be compared with the risk of mitigating a risk,

and the institutional arrangements, the processes for making those comparisons, need to be required and assured, otherwise the natural impulse to ignore risks will predominate.

So, the public sector establishes institutional rules to lean against these heuristic biases. To meet this challenge we institute:

- operating requirements to consider risks when proposing and implementing policy, in making investments, and in managing assets and liabilities;
- internal audit divisions and other review arrangements to monitor, review and reinforce those operating requirements;
- anticipatory governance arrangements focused on risks. (Boston, 2016)

This is known as the three lines model, a framework for managing risk and control. However, like all institutional arrangements, they need to be stewarded as part of good risk management practice, recognising that a good part of their role is to provide a check and balance against heuristic biases. Letting operational checks and balances entropy over time, letting internal audit divisions fall vacant for extended periods, deferring and cancelling audit and risk committees are red flags that need attending to. These institutions are an all-important part of public sector risk management.

The role of government

Governments are often viewed as the insurers of last resort, accepting catastrophic risk that insurance markets (including reinsurers) are unwilling to cover and that are not under the control of individual households or firms. Jean Tirole argues that this is for the 'common good':

> Risks that are not under the control of those concerned should be fully shared. When, on the other hand, people's actions affect the risks, they must be held partly responsible, to give them an incentive to behave in the collective interest rather than only in their own interest. (Tirole, 2017, pp.409–14)

There is little opportunity for individuals to control large catastrophes or disasters, be they natural disasters or large economic or social shocks, and it is governments that have the power to ensure those risks are fully shared. However, this is complicated. It isn't always easy to distinguish between moral hazard and bad luck, so we can't be sure how far to hold people responsible, and when the government should step in. 'Moral hazard' describes the circumstance where economic actors have an incentive to increase their exposure to risk because they do not bear the full costs of that risk. Insurance companies actively work to avoid covering risks where moral hazard might be at play. For example, medical insurers ask about pre-existing conditions before offering insurance. That is, however, not an option for a government offering national health insurance.

The key distinction between the government and markets is that governments can compel insurance, they can require risks to be shared, and they can tax negative externalities.

So, the government risk management role when the actions of those concerned affect the risks is a contested political space. Often, important public policy questions are over risk transfer, including when risk should be socialised and how to manage the political economy concerns arising, or when risk should stay privatised and how to manage the market regulatory concerns arising. Debates over these settings and changes to them will be ongoing, while at the same time there will be demands for consistency and predictability. Governments have real challenges in setting and adjusting the scope of their role.

The key distinction between the government and markets is that governments can compel insurance, they can require risks to be shared, and they can tax negative externalities. When they do so, they can be comparatively impervious to information on risks, setting a charge or price based on a societal risk tolerance. Private insurers, on the other hand, operating in a competitive market have limited ability to cross-subsidise, as premium levels will migrate to a level reflecting the individual risk characteristics of the insured.

However, with this power come dangers and the need for checks and balances to guard against government failures. Such 'government failure' problems that feature with government provision of insurance are as follows:

- Democratic, representative government is challenged by the influence of organised and mobilised interests through rent seeking. This is a serious issue in the case of New Zealand because the insurance sector is largely overseas-owned and insurers have the option of withdrawing from the local market without significant impact on their bottom lines. After the Canterbury earthquakes in 2010–11, while all the major players stayed, several small insurers exited New Zealand entirely.
- The short electoral cycles combined with public myopia leads to socially excessive discount rates for risk. Money put aside in insurance funds has a high cost compared with money being made available for more pressing needs. For example, prior to the Canterbury earthquakes in 2010–11, there had been an ongoing conflict between EQC (now the Natural Hazards Commission) and the government over whether the built-up investment of the National Disaster Fund should reduce government debt or be invested.
- The political necessity for a government to be 'seen to be doing something' in the wake of a disaster affects claims and has a Ricardian impact[3] on expectations. The countervailing influence of

shareholders of an insurance provider meeting claims in the event of a disaster is much stronger than taxpayer concern in having an impact on claims management decisions – especially given the need for elected officials to show compassion.
- Finally, the limited competition faced by bureaucracies administering insurance means that the dynamic efficiencies that the market exploits are less likely to be as quickly adopted by government bodies.

So, in a sphere of activity where market failure and government failure abound, how do we ensure the best synergy, the best balance between the two?

Joseph Stiglitz (Stiglitz, 2006) has identified an insurance role for governments, using the market failure/government failure paradigm, when there are:

- important risks for which the market does not provide adequate affordable or equitable insurance, such as inflation, floods and crime;
- important risks for which individuals and firms frequently choose not to buy insurance, but which result in significant adverse consequences for those individuals, leading to government bailouts (and because government cannot commit itself not to engage in such bailouts, there is, in fact, an incentive for individuals not to purchase adequate insurance);
- important risks for which the market provides insurance, but inefficiently and/or at a high cost (contributing, of course, to individuals not purchasing adequate insurance); and
- intergenerational risks.

Generally, he ascribes these market failures to adverse selection and moral hazard problems. Given that it is difficult for firms (let alone regulators) to know whether risk has been priced well, and therefore whether, in fact, risks are covered, and given that it is difficult for governments to resist bailing out large numbers of uninsured or underinsured individuals when disasters happen, there is a role for government ex ante. He warns, however, that providing ex post insurance for implicit liabilities is inefficient and inequitable.

So, the most important task for governments is establishing clearly specified, properly justified, and tolerably fair ex ante expectations of government support when misfortune occurs. At their best, ACC and the Natural Hazards Commission do this well; however, where there are gaps in expectations between citizens and these government agencies, and between expectations and actual performance, then those checks and balances have let us down. This can be observed in the amount of costly (for both parties) litigation when expected compensation has not been forthcoming.

Looking to the future, a challenge for the government is getting the same alignment in expectations for pandemics, space weather events, and climate change impacts and responses as it has for accidents and earthquakes.

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The challenge of articulating risk appetites and tolerances

The theory is simple. If something exceeds our risk appetite, then we should take measures to avoid, control or transfer the risk. Otherwise, we are reckless. However, risks cannot all be eliminated. Some risk must be tolerated. Indeed, whenever the current circumstances (social, economic, environmental) are unsatisfactory and change and innovation is desired, then risks must be embraced and accepted, and the tolerance level will be high. If we don't tolerate risk, then we will also not tolerate opportunity. We will be overly risk averse, and insufficiently adaptable. So, there is a risk management task to set and articulate risk appetites and tolerances and stay within them – to be neither reckless nor overly risk averse.

The practice is hard. It is hard to determine and articulate what is acceptable or tolerable. Risk appetites and risk tolerances are time and space inconsistent. Different decisions may be made over the same choice if it is presented in different forms (Kahneman and Tversky, 1979). Sitting in a casino after a windfall is quite a different experience from checking prices in a supermarket after a job loss. So, what we say about our risk tolerances here and now is likely to be quite different from what we say there and later. Different attitudes to risk co-exist; some will be risk-takers in some areas and conservative in others, and others will take the opposite view. Seeking a societal consensus on risk that can be acted on by governments is clearly in itself a hazardous task.

The main way that government sets risk appetites and tolerances is through regulation, which provides markers of risk appetites and tolerances for society to lead and follow. Society leads through its participation in the due processes of setting regulation; it follows as it complies with established regulation. Examples include an expression of:

- the risk appetite for road safety set by speed limits or traffic cone requirements;
- the risk tolerance of building safety set by engineering and building standards;
- the risk tolerance for limited development in areas subject to high natural hazard risk set in land-use planning;
- the solvency requirements for insurers set at surviving up to 1-in-1,000-year stress tests.

These societal markers are important for individual decision making. It makes little sense to insure against a 1-in-5,000-year event when your insurer is likely to go broke in a 1-in-1,000-year event. The speed limit is an important factor in how fast someone drives.

However, not all behaviour can or should be regulated, and often regulations

set markers that individuals may want to live within. Organisations also must set risk tolerances and appetites where their own actions cause the risks and where they will be held accountable for those actions.

Sometimes these risk appetites are well articulated, as with financial reserves policies. Sometimes they are implicit and revealed through management actions, often described as the 'tone from the top'. For example, if senior management appears unconcerned with risk management and internal control, then employees down the line will be more inclined to feel that appropriate management of risk through effective controls is not a priority.

While a code of conduct can support and enable the desired types of employee behaviour, it is how the principles in such codes are continuously reinforced in word and deed, with training programmes, modelled behaviour, and actions in response to violations that matter for good risk management.

The recent trend by chartered accountants to increase the ethics component of their compulsory professional development requirements, where practical discussion and debate is held about common and credible situations at the edge of risk tolerances and risk appetites, would be a welcome development for policy analysts generally.

The challenge of appropriate response

When problems and disasters strike, it can be challenging to respond appropriately. As noted in the starting section, the crystallisation of risks occurs along a continuum. Often when problems emerge, responses can be characterised as fight or flight:

- Fight involves acknowledging the problem and its causes, taking ownership, and working hard to redress the problem and fix the causes. Change agents are needed. For public sector organisations operating in this mode, the protection of the public being served is paramount.
- Flight involves damage control and seeking to get back to an equilibrium as soon as possible. Lawyers are needed. For public sector organisations operating in this mode, the protection of the public sector entity's capacity to perform is paramount.

The most egregious examples of inappropriate response are when the wrong choice is made. The Royal Commission of Inquiry into Abuse in Care has laid bare the terrible impact of the wrong course of action. Getting the choice right requires a quick and honest assessment of culpability, and the integrity and courage to act accordingly. Getting this right more often requires incentives to encourage appropriate behaviour. It might be useful, for example, to reward and recognise people for their integrity in opening and dealing with 'cans of worms' rather than recognising and rewarding people for being a 'safe pair of hands'.

> Proactively and clearly controlling, avoiding, sharing and transferring and accepting risk in a well-informed way ensures that when shocks or disasters happen, the robustness and redundancy in public policy delivery systems absorbs much of the impact …

When culpability is not so important – for example, with natural hazard crises, pandemics and other economic and social shocks – response activity will be characterised by high stress levels, significant uncertainty and demand for speed. Responses will inevitably be reviewed. These reviews are blessed and cursed with hindsight; there seems to be an inevitability about the past that did not exist at the time. For example, all of the many reviews into the response to the North Island severe weather events around Auckland Anniversary weekend 2023 ignored the *Kaitaki* losing power in Cook Strait with around 900 people on board on 28 January, and the runway excursion at Auckland International Airport of a Boeing 777 with 287 people on board on 27 January. These could have totally changed the complexion of the North Island severe weather events; but, as we now know, these near misses did not cause any fatalities, or loss of assets, and therefore did not feature in those reviews.

Applying some foresight, the next review of a crisis or emergency response is likely to find the following:

- Community resilience is important. Communities fare better if there are strong connections and relationships between community members and leaders, marae, businesses, other community collectives, local authorities and emergency services, and where households and whānau are prepared. Improvements to co-operative arrangements, and public information improvements, including public alerting and making sure the information is understandable, will be recommended.
- Situational awareness is critical. Gaps in intelligence and situational awareness to inform decision making have an impact on the effectiveness of incident management in supporting communities through the response and early recovery stages. Improvements in gathering intelligence for situational awareness will be recommended.
- Response leadership matters. Emergency declaration and activation processes and procedures need to be clear. Leadership behaviours, such as communicating the transfer of leadership, clear tasking and having consistent communication of decisions across shifts, if not done well, have an impact on staff and other agencies knowing who is in charge and what is

expected of them. More clarity and more leadership capability will be recommended.

- Goodwill and flexibility of trained emergency managers and volunteers is invaluable. There may not be enough professional emergency management personnel available for the scale and duration of risks we face. Securing backup and suitable equipment and technology will reduce the impacts, but if these are not readily available, the outcome will not be as good as possible. More training and development for response staff and volunteers, and training for managing complex, large-scale events will be recommended.
- Governance arrangements, if complex and uncertain, cause strain. Incompatible processes and the level of interconnection between local, regional and national levels need work. Large-scale responses inevitably require some centralisation followed by some decentralisation, so roles and responsibilities change over time. Recommendations to manage these transitions will be made.

The above list demonstrates some of the challenges in doing emergency response well.[4] The challenge is not actually knowing what is needed; we have built up enough experience to provide that. Each new disaster merely confirms that knowledge. The challenge is in putting a sufficient priority on implementing these recommendations prior to the next disaster, and avoiding a review that simply repeats the findings of previous reviews.

Conclusion

Risk, the impact of uncertainty on objectives, is everywhere and is hard to manage. The fact that we often seem to get it wrong demonstrates that. This article has identified a number of key challenges that need to be overcome for risk management to be done well. Strategies to meet these challenges have been suggested. They require the application not so much of a silver bullet, but rather of an ongoing effort aimed at continuous improvement. They require avoiding traps associated with the failure to use probability analyses, lazy thinking, heuristic biases, inappropriate government intervention, inappropriate fight or flight responses, and inadequate preparation for responding to emergencies.

The gains to be made are worth it. Proactively and clearly controlling, avoiding, sharing and transferring and accepting risk in a well-informed way ensures that when shocks or disasters happen, the robustness and redundancy in public policy delivery systems absorbs much of the impact, and the readiness of public policy to respond and recover means we quickly adapt and thrive.

1 Hubbard (2020) explains the benefits and methodologies involved in probabilistic analysis as a means of fixing risk management. Stochastic analyses such as Monte Carlo simulations can now be performed on Excel spreadsheets.

2 Peter Gluckman and Anne Bardsley have prepared a useful description of cognitive biases and heuristics that affect human decision making and risk in Gluckman and Bardsle (2016).

3 The Ricardian equivalence proposition is an economic hypothesis holding that consumers are forward-looking and so internalise the government's budget. In the context of disaster insurance, if the government will compensate for disasters, why should citizens spend their own resources to mitigate or transfer risks?

4 The list was compiled from NEMA (2024).

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