Good Ancestors Policy

Good Ancestors Policy is an Australian charity dedicated to reducing existential risk and improving the long-term future of humanity. We care about today's Australians and future generations. We believe that Australians and our leaders want to take meaningful action to combat the big challenges Australia and the world are facing. We want to help by making forward-looking policy recommendations that are rigorous, evidence-based, practical and impactful.

Good Ancestors is active in the Australian conversation about catastrophic disasters, including the Disaster Ready Fund[1] and the Defence Strategic Review.[2] We liaise with community groups and organisations around the country who care about future generations and having a positive impact on the world.

Our key concern, and the concern we hear from the Australian community, is that the overwhelming focus of Australia's disaster management arrangements is on the disaster types that we, regrettably, experience all too often – like fires, floods and storms. Catastrophic disasters are neglected. **While catastrophic disasters are less likely, they can be orders of magnitude more consequential and represent the significant majority of disaster risk.**

[1] Disaster ready fund — The Good Ancestors Project
[2] Defence strategic review — The Good Ancestors Project

To illustrate this from an all-hazards perspective, research shows that the number of new pathogen outbreaks has been increasing since the 1940s and the expected deaths from future pandemics are at least an order of magnitude higher than all other natural disasters combined.[3] Assuming that work to mitigate different hazards is equally effective, Australians would expect that efforts to prevent and prepare for the next pandemic would exceed all other disaster prevention and preparation efforts combined. Despite the big picture, Government has been moving away from all-hazards thinking.

The drift away from an all-hazards approach has dangerous consequences. To extend the above pandemic example, Victoria is refreshing its Biosecurity Strategy.[4] The draft acknowledges that at least 75% of the new human infectious diseases since the 1970s have originated from animal diseases. Despite that, the draft offers no initiatives to control zoonoses. That is, a hazard type that potentially exceeds the risk of all other natural hazards combined is subject to no mitigations. Other states are taking similar approaches. Despite the risk, public documents suggest that NEMA and the Department of Home Affairs have not engaged with Agriculture Victoria about the important role it could be playing in reducing some of the largest risks on the all-hazards spectrum.

The neglect of pandemic prevention is just one example of a "big risk" with intergenerational consequences that fall into the blindspots of Australia's emergency management arrangements. Australia has historically taken an approach of developing capability targeting common hazard types, and then adapting that capability in the event of a catastrophic disaster. This paper explains that, given the majority of risk comes from catastrophic hazards, they should be the main focus of the Commonwealth's efforts.

Overall, reform of Commonwealth capability should consider all hazards and prioritise efforts based on an evidence-based assessment of risk. That means building future capabilities specifically to address catastrophic risks.

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[3] Global trends in emerging infectious diseases | Nature [Internet]. [cited 2023 Mar 14]. Available from: https://www.nature.com/articles/nature06536; Stefan C, Talbot T, Glassman A, Fan V, Hevey E, Smitham E. The Next Pandemic: If We Can't Respond, We're Not Prepared [Internet]. 2023 Feb. Available from: https://www.cgdev.org/sites/default/files/next-pandemic-if-we-cant-respond-were-not-prepared.pdf

[4] Victorian Biosecurity Strategy Consultation | Engage Victoria

An all-hazard risk "sketch" in the Australian context

In the most basic terms, risk is a product of likelihood and consequence (with an adjustment for uncertainty). If a hazard has a 50% chance of killing 100 people in a given year, its "expected harm" is 50 lives per year. If a hazard has a 5% chance of killing 1,000 in a given year, its expected harm is also 50 lives per year.

A shallow sketch of the disaster risk landscape in Australia hints that our current posture is radically misaligned with the actual hazard environment.[5]

Cyclones caused 206 fatalities between 1970 and 2017 – an expected harm of **4.3 lives per year**.[6]

Bushfires caused 825 civilian and firefighter fatalities between 1901 and 2011 – an expected harm of **7.5 lives per year**.[7] This number could be substantially higher if second-order smoke-related deaths are included.[8]

Floods caused 1,859 fatalities between 1900 and 2015, resulting in an expected harm of **16 lives per year**.[9]

Heatwaves caused 354 fatalities between 2000 and 2018, resulting in an expected harm of **20 lives per year**.[10] This number could be less if measured in Quality Adjusted Life Years (QALYs).[11]

Large volcanic eruptions causing global famines, like the Mount Tambora eruption in 1815-1816, could happen once every 625 years.[12] Tambora caused

[5] Note that this "sketch" is intended to be illustrative only - a robust approach would use a formal risk assessment method, account specifically for uncertainty, consider many more factors in the model, seek a wide range of expert views, and draw on a range of evidence and modelling. Acknowledging the overwhelming limitations, this "sketch" approach might be accurate to an order of magnitude, and serves to illustrate how significant the variation between hazard types might be.

[6] Tropical cyclones in Australia: Frequency, severity, death toll, damage bill and climate change impact, explained (9news.com.au)

[7] Understanding loss of life in bushfires - CSIRO

[8] More than 2,400 lives will be lost to bushfires in Australia over a decade, experts predict | Health | The Guardian

[9] Where, why and how are Australians dying in floods? | Bushfire & Natural Hazards CRC (bnhcrc.com.au)

[10] Heatwave fatalities in Australia, 2001–2018: An analysis of coronial records - ScienceDirect

[11] QALYs are a measure of the value of health outcomes. QALYs factor in the length of a person's life in an attempt to factor in a range of attributes into a single index measure. When the harms of disasters are measured in QALYs, disasters that disproportionately impact older people will be measured as of lower consequence.

[12] Humanity Is 'Woefully Unprepared' for a Major Volcanic Eruption (gizmodo.com.au)

roughly 0.1% of the world's population to die of starvation.[13] On a pro-rata basis, that would be 26,000 Australians dying of starvation. The expected harm of famine resulting from volcanic eruption could be **42 lives per year**. This could vary if second-order effects are included or the estimate is based on up-to-date food supply chain modelling. Global supply chains could make the world more resilient to these kinds of crises because food can be sourced from more locations, or less resilient because "just in time" supply chains are more vulnerable to shocks. Overall, the risk of famine from a volcanic eruption might be an order of magnitude higher than bushfires.

Pandemics happen in the order of once every 100 years. COVID-19 has killed 23,000 Australians.[14] "Spanish Flu" killed about 15,000 Australians.[15] Using those figures, the expected harm of pandemics is about **190 lives per year**. This number could be less if measured in QALYs, but may increase over time with the proliferation of biotechnology and if second-order impacts are included.[16]

Experts assess that a **nuclear war** could kill 5 billion people, or 60% of the earth's population.[17] The recent UK national risk assessment sets the annual risk at between 1-5% (much higher than other experts).[18] Taking the lower bound and applying consequences to Australians on a pro-rata basis, a nuclear war could kill 16 million Australians. At a 1% chance, the expected harm of nuclear war is 156,000 Australian lives per year. A more robust calculation that uses more commonly held likelihood estimates (0.1%~ chance) and factors in Australia's remote location may produce a more conservative expected harm in the order of **7,000 Australian lives per year**.

The risk from **space weather** is even more uncertain because we do not have good historical records of likelihood and we do not have a good understanding of consequences for modern infrastructure. Proxy evidence from carbon-14 and beryllium-10 "spikes" associated with "Miyake events" and records from the

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[13] The population of the Earth in 1800 was around 1 billion people. The "year without a summer" was estimated to have killed around 1 million people. The Deadliest Volcanic Eruption in History | HISTORY Population Growth - Our World in Data

[14] Australia: Coronavirus Pandemic Country Profile - Our World in Data

[15] Influenza pandemic | National Museum of Australia (nma.gov.au)

[16] GCSP Publication | Delay, Detect, Defend: Preparing for a Future in which Thousands Can Release New Pandemics

[17] Nuclear war between the U.S. and Russia would kill more than 5 billion people – just from starvation, study finds - CBS News

[18] National Risk Register 2023 - GOV.UK (www.gov.uk)

Carrington Event suggest that these events could occur somewhere between once every 100 and once every 1000 years.[19] Given the Carrington event damaged most of the nascent communications infrastructure on earth, and the most significant Miyake events seem to be 100 times stronger, the consequence of these events could be catastrophic for power and communications infrastructure, triggering global cascading failures.[20] Overall, the expected harm could be **somewhere between heatwaves and nuclear war**.[21]

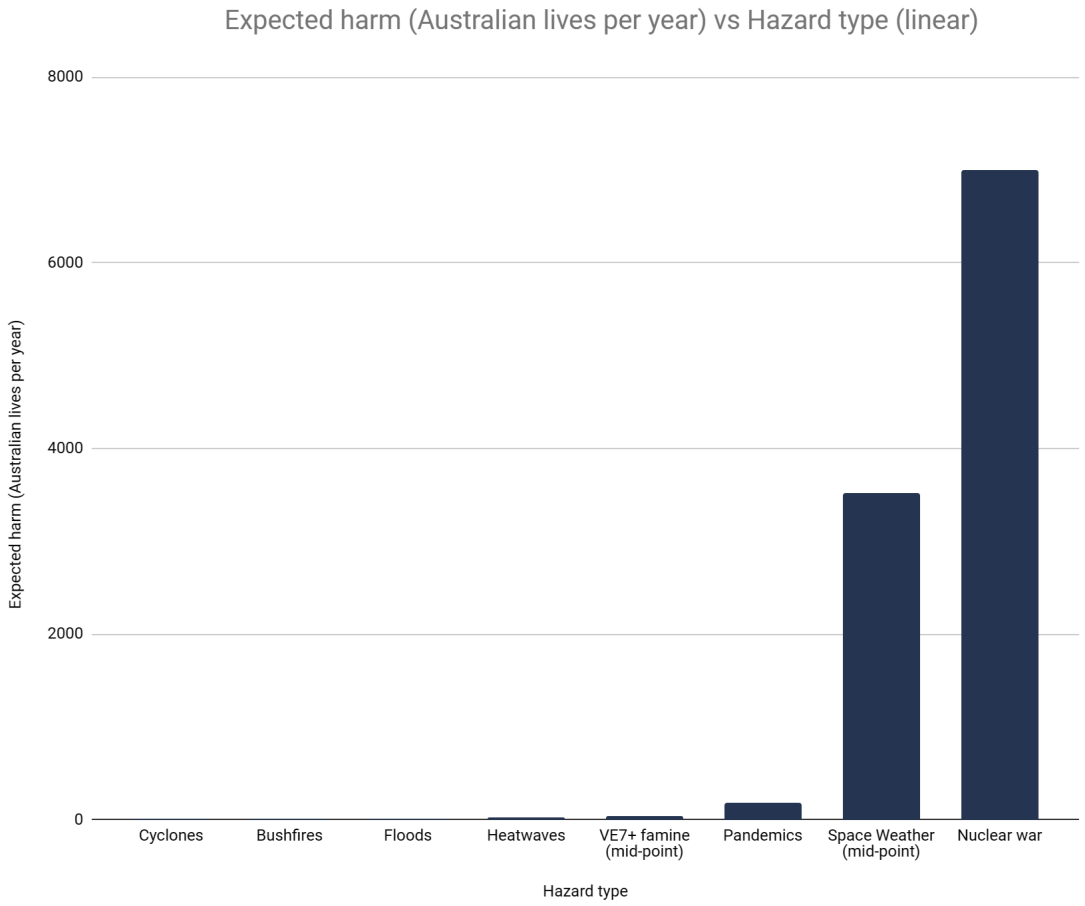

Figure 1. Sketch of expected harms of various hazards (linear). Figure 1 graphs the sketch of expected harm without adjusting the Y-axis. Risk methodologies often adjust the Y-axis (by "scoring" consequences or using a logarithm) to make the data easier to read. While this can be helpful, it can often obscure the fact that catastrophic risks are many orders of magnitude worse than other risks.

[19] Extreme Miyake radiation events captured in tree rings stump scientists - ABC News
[20] The Carrington Event: History's greatest solar storm | Space; Long-term cost-effectiveness of interventions for loss of electricity/industry compared to artificial general intelligence safety (allfed.info)
[21] Noting the uncertainty the consequence estimate, the risk likely to be at the lower end of this range.

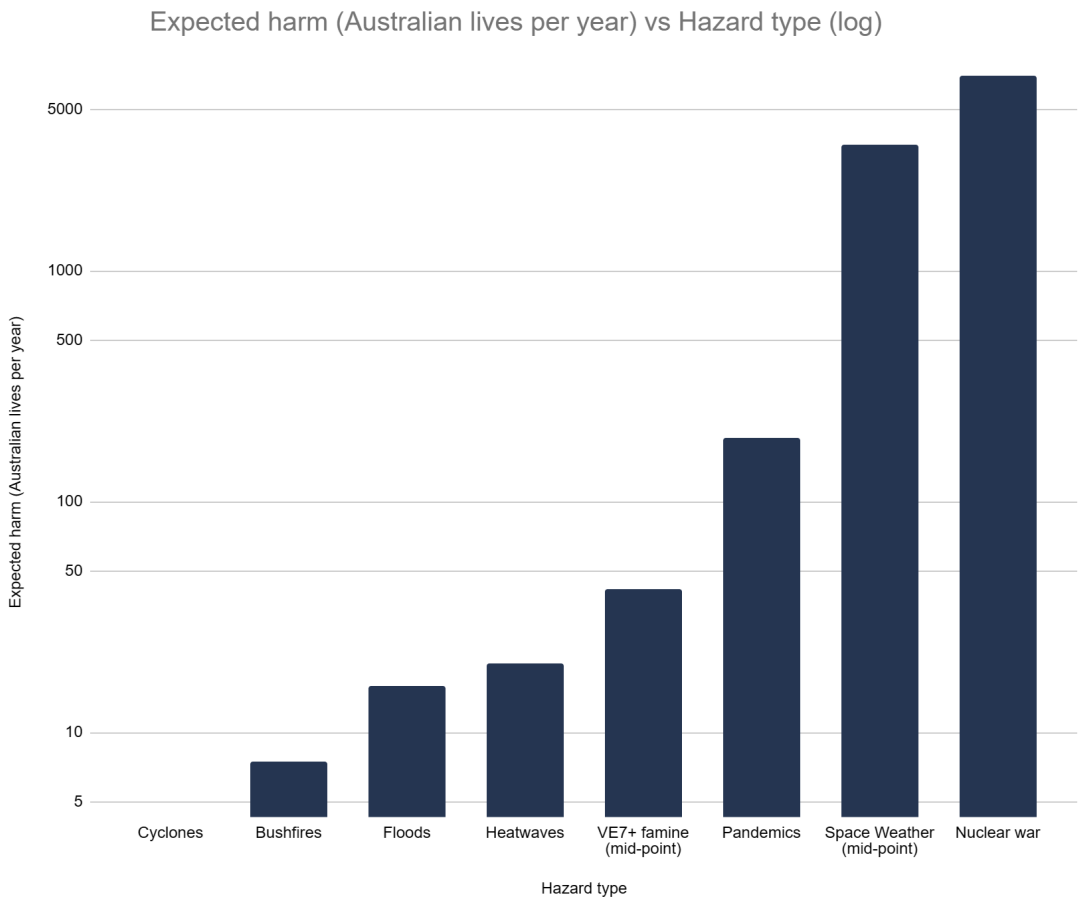

Figure 2. Sketch of expected harms of various hazards (log). Figure 2 graphs the sketch of expected harm while adjusting the Y-axis. This presentation of the data helps aid comparison between different kinds of hazard, but tends to obscure the magnitude of the difference between hazard types.

Appreciating that this is the crudest possible sketch of the risk landscape, it does suggest that catastrophic hazards are often 10 or 100 times less likely than the hazards we are more familiar with, while potentially being more than 100 or 1000 times as consequential. Therefore, it is likely to be the case that **the lion's share of risk comes from large-scale hazards, not more familiar hazards**. Phrased another way, if the reader of this document were to die in a disaster, it is much more likely to be a nuclear war, pandemic or famine than a fire, flood or storm.

Dr Andrew Leigh MP's book "What's The Worst Can Could Happen" expresses this same concern with the stat that **the typical Australian is fifteen times more likely to die as a result of a catastrophic disaster than to be killed in a car crash**.[22]

[22] What's the worst that could happen? By Andrew Leigh (socialsciences.org.au)

This analysis leads to an overall picture of misalignment. **Most of the risk is not where most of the Government's focus is**. For instance, while catastrophic natural hazards are in scope for the Disaster Ready Fund, **no grants from the first DRF round were targeted at a catastrophic hazard**. Approximately half of the funds went specifically to bushfire mitigation and preparedness.[23]

This does lead to some cause for optimism via the prospect of "low-hanging fruit" mitigations. Given there is relatively significant investment to mitigate fires and floods – further investment likely suffers from diminishing returns. That is, funding can only ever go to the "next best" intervention. After the best interventions are funded, further grants have to go to less effective options. However, for catastrophic hazards where there is almost no investment, the "next best" project might be the best possible project. In other contexts, the most impactful interventions are often 10x or 100x better than average interventions.[24] **Government spending to mitigate a neglected and risky catastrophic hazard could represent over 1,000x better value for money than similar investments for a more frequent hazard type.**

Overall, the starting point for any government approach to designing its capabilities and reducing risk should be the risk that a given hazard poses to Australians. We should focus more on significant risks and focus less where the risk is lower. This suggests **Australia needs a significantly greater focus on nuclear wars, pandemics, events that might interrupt food supply, and space weather. New Commonwealth capabilities should be designed with mitigating these hazards as the primary objective.**

Setting aside the macro level, this approach to thinking about risk can also help guide government action at a micro level (discussed further at **Attachment A**). If research is correct that the Black Summer bushfires caused 417 second-order deaths from smoke exposure (compared to 34 directly), perhaps the substantial majority of effort to address bushfire risk – including when communicating hazards to the public – should address the impact of smoke on population-dense areas. Indoor air quality interventions could save many more lives-per-dollar than hazard-reduction burns (which could be net-negative if they cause meaningful smoke exposure for a slight reduction of other risks).

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[23] Bushfire season preparedness set to be focus of national summit (homeaffairs.gov.au)
[24] How much do solutions to social problems differ in their effectiveness? A collection of all the studies we could find. - 80,000 Hours % (80000hours.org)

Long tail distributions

> *As data scientists, statisticians or modellers we should view it as a cardinal sin to confuse long tailed phenomena for normally distributed phenomena. We must commit to understanding the drivers of events so that we can manage them correctly.*[25]

The fact that the majority of disaster risk is from a small number of rare events might be counterintuitive. Our instinct might be that disaster risk follows something like a normal distribution (see figure 3) or Maxwell distribution (see figure 5).

Various distributions occur in nature and society. For instance, the distribution of people's height will follow a normal distribution. If disaster risk followed a distribution like this, it would be reasonable to focus on "typical" events, not "outlier" events.

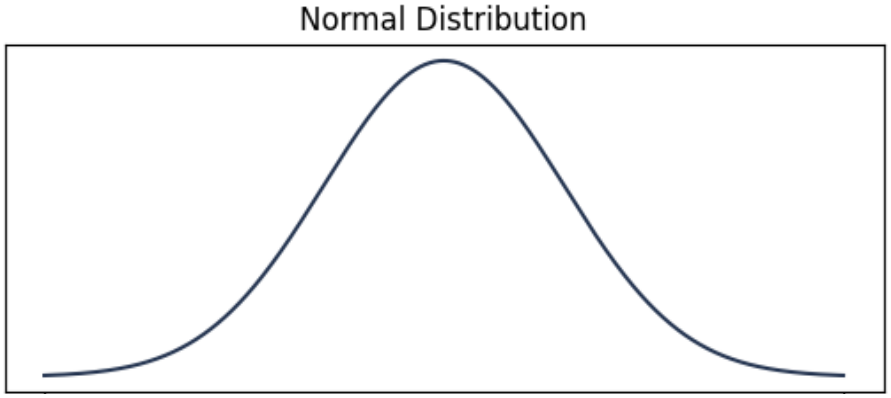

Figure 3. Normal distribution

Long tail distributions (see figure 4) are also frequent in society and nature. Things from the size of craters on the moon, the distribution of wealth in society or deaths caused by wars all follow long tail distributions.[26]

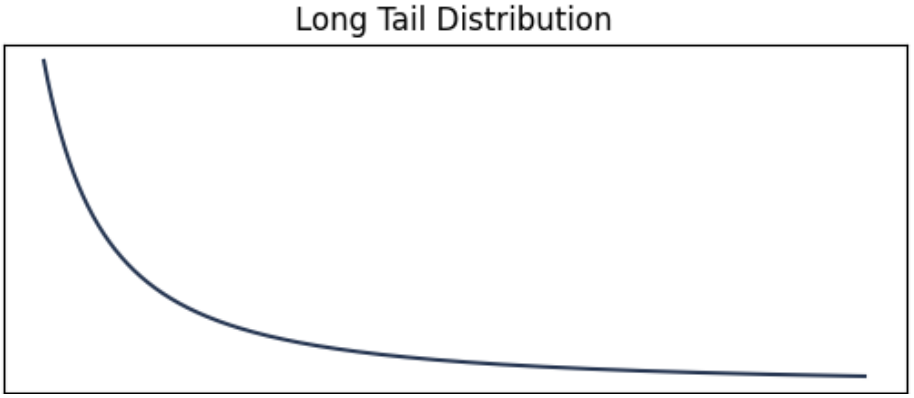

Figure 4. Long Tail Distribution

Natural hazards tend to follow long tail (or heavy tail) distributions both within and between hazard types. In a long tail distribution, small-scale events are high in frequency but, perhaps counterintuitively, the majority of the impact is from events that are rare but catastrophic.

[25] The Extreme Power of Long Tailed Distributions | by John Adeojo | Towards Data Science
[26] https://www.tandfonline.com/doi/abs/10.1080/00107510500052444

While there are many hundreds of bushfires in Australia each year, most fires are of little consequence. Only a small fraction of bushfires cause fatalities. Of those, a substantial portion of all Australian bushfire fatalities were caused by only three events (Black Saturday, Ash Wednesday and Black Friday).

This same distribution holds as you add more hazard types, include more jurisdictions or cover longer periods. We should worry most about the a-typical hazard at the far right of the graph.

Theory in action

Applying this theory, Good Ancestors thinks that current Australian investment in emergency management risk mitigations and capabilities assumes that the distribution of risk is similar to the depiction in Figure 5. Figure 5 shows the majority of risk resulting from cumulative consequences of small to medium hazards that occur relatively frequently. The intuition seems to be that the cumulative risk of the kinds of floods and fires we regrettably experience most years surpasses the risk of less likely hazard types, which is why frequent hazard types are the main focus.

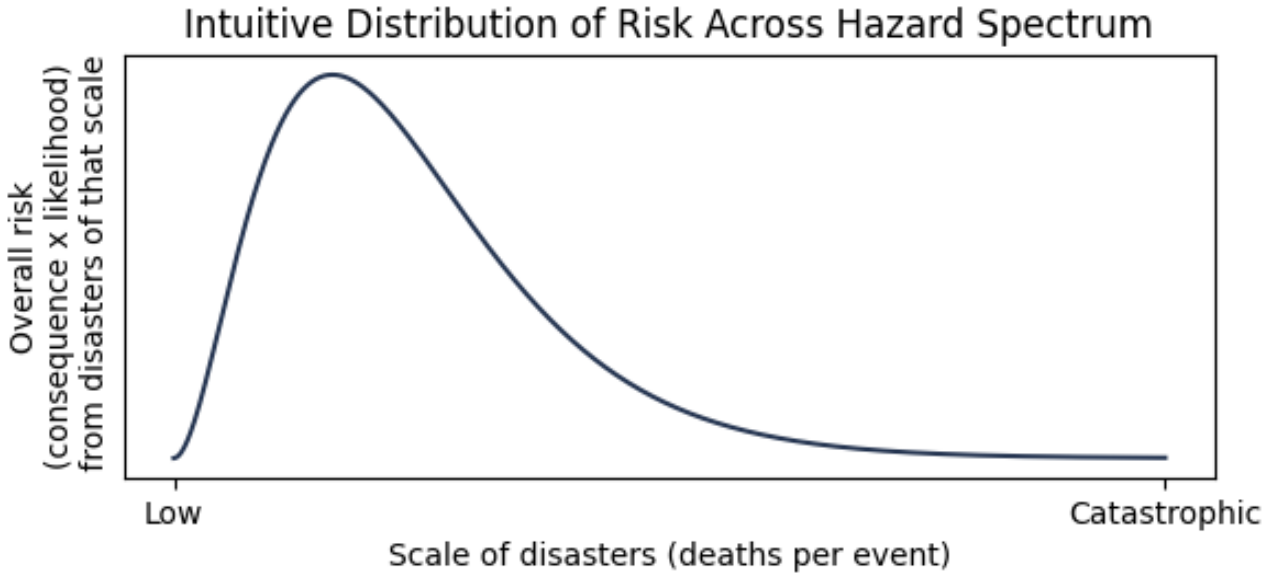

Figure 5. A surmised risk distribution that would explain current emergency management prioritisation. The curve depicts instances of hazards with insignificant consequences (like fires in remote locations) as having very low overall risk. The majority of the risk comes from harmful but frequent events, like fires, floods and cyclones. Although catastrophic events (like solar storms or nuclear wars) do represent some risk, because they are so unlikely, they do not represent a significant risk overall. Good Ancestors does not think this "intuitive distribution" is supported by evidence.

Good Ancestor's assessment of the available evidence is that the distribution of risk looks more like the depiction in Figure 6. Figure 6 shows a risk distribution where the cumulative consequence of relatively frequent disasters does not approach less likely but catastrophic disasters. The substantial majority of overall risk comes from events that occur rarely.

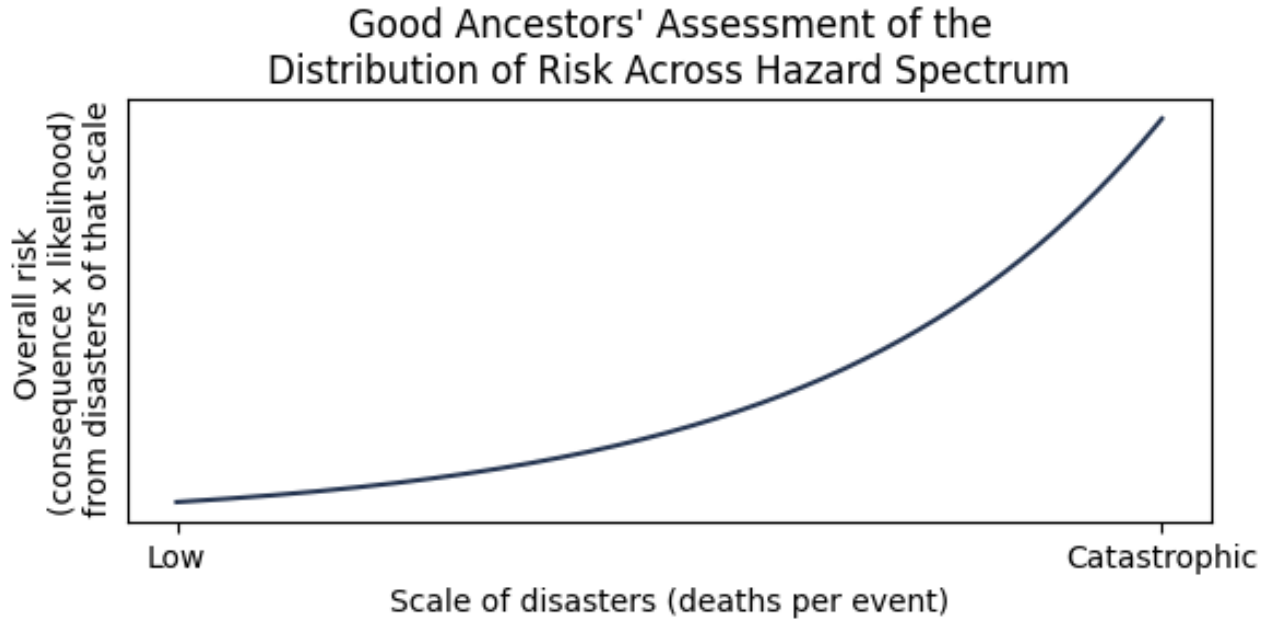

Figure 6. An idealised version of actual risk distribution that should inform emergency management prioritisation. The curve depicts lower consequences hazards not having a significant additive effect even though they are more frequent. Comparatively rare catastrophic hazards represent the majority of risk because their consequence is orders of magnitude higher than more frequent risks. Figure 6 is similar to our findings in Figures 1 and 2.

This helps illustrate our finding that mitigations and capability development focused on rare and catastrophic hazards would have a significant impact in reducing overall disaster risk.

Systemic problems needing reform

The misalignment between risk and capability detailed above has been caused by systemic issues with Australia's emergency management approach. This section identifies systemic issues that could be a target of reform.

Short-term thinking

Australia's current disaster prioritisation does not align with risk, but it does align with likelihood. We focus on the disasters we have experienced and we appoint leaders who have handled those disasters well.

That regular Australians are not experts on the full gamut of hazards is understandable. Government's function should be to mitigate these risks precisely so Australians can get on with what matters to them. It's also understandable that politicians are responsive to the priorities of their electorate and that the media cycle is responsive to the interests of their audiences. Combined, these trends encourage focus on hazards that are part of our common experience - fires, floods and storms.

In light of these trends, the proper function of the public service is understanding evidence, applying rigour, providing frank and fearless advice, and providing the communication and leadership necessary to follow the evidence. In a system where multiple forces encourage short-term thinking, the public service should be a counterbalance that emphasises the long-term. Specifically, **organisations like Home Affairs and NEMA should demonstrate that disaster risk follows a long-tail distribution, communicate that fact to the public and politicians, and take action by targeting capability development towards catastrophic hazards.**

Lack of systematic risk assessment in Australia

There is no systematic assessment of the risks facing Australia. We don't know what the risks are, and we don't prioritise them.

Almost all states and territories have a risk register but adopt different methodologies. **A review by Good Ancestors found 31 different risks identified across the registers, only 4 of which (bushfire, earthquake, flood and storm) were in common across all the registers**. Significant numbers of national risks appeared on no registers.

Australia is an outlier among advanced countries by not conducting a national risk assessment. A 2016 survey of 33 OECD countries plus Colombia and Costa Rica showed that approximately 90% of them had a National Risk Assessment.

Academic and civil society experts, including Dr Arnagretta Hunter and Rumtin Sepasspour from the ANU, are offering to assist the Government and have published on the topic.[27]

Without a robust, all-hazards national risk assessment, any meaningful attempt to reform this space is unlikely to maximise its positive impact.

Backsliding on all-hazards thinking

An "all-hazards" approach is the long-standing backbone of effective disaster management. An all-hazard approach enables a proper understanding of risk, a proper deployment of efforts to mitigate risk, and a proper assignment of responsibility for risk. Australia acknowledges the importance of an all-hazards approach - citing it frequently from the Australian Disaster Resilience Handbook to our engagement in the UN on the Sendai Framework.[28]

Despite this, **Australia does not take an all-hazards approach**. Many of the key planks of Australia's approach – including the National Disaster Risk Reduction Framework and the Disaster Ready Fund – are explicitly limited to "natural hazards". Even then, the NDRRF and the corresponding National Action Plan do not mention catastrophic natural hazards and focus exclusively on a narrow set of natural hazards – bushfires, floods, cyclones and storms – with occasional references to heatwaves, earthquakes and tsunamis.

Although "natural disasters" are given primacy, **natural disasters don't exist**. This is true in several ways:

- All disasters are about the interface with humans.
- Many of the disasters we think about as "natural disasters" are proximately caused by humans. For instance, most of the bushfires that cause fatalities are deliberately lit or caused by powerlines, and many of the floods that cause fatalities are caused by intentional releases from dams.

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[27] Australia's national risk assessment: perspectives and recommendations from risk and resilience experts - RegNet - ANU Arnagretta Hunter, Rumtin Sepasspour | Australian government is still without a national risk assesment | The Canberra Times | Canberra, ACT

[28] handbook_aema_web_2023.pdf (aidr.org.au)

- Many of the disasters we think about as "natural disasters" are shaped by human action at various scales. That could include climate change driving fires or river management practices driving flooding.
- Pandemics often result from naturally occurring viruses. These are natural disasters but they are often arbitrarily excluded (as in the DRF).
- Many human-caused crises, from wars to mass migrations, are accelerated by natural pressures.
- Often, the distinction is inconsequential. For instance, the response to a fire started by a human is largely the same as a fire started by lightning. The food supply chain mitigations relevant to a large volcanic eruption are largely the same as those for a nuclear winter.
- Ultimately, it doesn't matter to victims exactly how a hazard was triggered. What matters is that Australians are kept safe.

While "natural disasters" or "natural hazards" might seem like a practical shorthand for assigning bureaucratic responsibilities, the approach creates a rift through the heart of the concepts that matter most. That arbitrary divide allows things to "fall through the cracks" and muddies responsibilities.

Lack of clear communication between states and territories

Good Ancestors' experience working across the State and Commonwealth divide has shown that neither party feels it has the lead on large-scale risks. Commonwealth documentation repeats that primary responsibility sits with the states and territories, but states and territories assume that disasters of national and global scale are handled at the Commonwealth level.

National strategies refuse to bite down on this question. For instance, the 2011 National Strategy for Disaster Resilience[29] is cited by the Commonwealth to support the claim that all Australian governments have endorsed a particular approach to shared responsibility.[30] However, the NSDR never discusses large-scale risks and never articulates how its "shared responsibility model" applies in those circumstances. Something that is everyone's responsibility is ultimately no one's responsibility.

[29] National-Strategy-for-Disaster-Resilience (homeaffairs.gov.au)
[30] The Second National Action Plan to implement the National Disaster Risk Reduction Framework (nema.gov.au) (page 8)

This has played out in practice in decisions made under the Disaster Ready Fund. The DRF is structured so that applicants approach a state or territory, and then projects endorsed by the jurisdiction go to the Commonwealth for final decision. However, when talking to individual jurisdictions, they are disinclined to support proposals with nationwide benefits because the particular narrative about the benefit to their community is diluted. There's no ability to present a project with national benefit at a national level. This is evidence that **preparing for catastrophic disasters is falling through the cracks in the Federation**.

No holistic consideration of the effect of mitigations

Taking a broader perspective is essential to understanding the positive and negative impact of proposed mitigations. The fractures described above – across hazard types and across jurisdictional boundaries - mean that **the cost-effectiveness of some mitigations is dramatically underestimated**.

For instance, the benefit of having a plan for catastrophic hazard type accrues roughly evenly to all Australians. If Tasmania considered making such a plan, and considered only the benefit of that plan to Tasmanians, it would fail to measure 98% of the potential benefit.

This is made more acute when mitigations cross artificial boundaries between natural and human-caused hazards. Some mitigations only address one hazard, whereas other mitigations address many hazard types. By not taking account of all-hazards, we can't properly assess the benefit of an intervention. This means that small and targeted interventions attract funding while big-picture interventions are neglected.

To give a specific example, indoor air quality improvements might be one of the highest-impact hazard reduction approaches available. This is because indoor air quality interventions mitigate second-order effects from bushfires (which are potentially 10x more dangerous than the first-order effects), they mitigate harms from pandemics (which are potentially 30x more dangerous than the first-order effects of bushfires) and they mitigate underlying health risks that cause thousands of deaths in Australia each year.[31] The cost of the intervention could also be quite low if implemented at scale through building standards and via a

[31] Air pollution causes thousands of deaths in Australia each year. Residents and scientists are fighting back - ABC News; Australia Air Quality Index (AQI) and Air Pollution information | IQAir

national strategy. Good Ancestors suggests the reason this kind of intervention is not currently a top priority (or, worse, even being considered) is precisely the factors set out above – lacking risk assessments, poor prioritisation of hazards, poor coordination and communication across hazards types, poor coordination and communication across state and federal spheres of responsibility, and an inability to assess the effectiveness of mitigations across domains.

A similar concern plays out in planning for catastrophic disasters. In general, the cost of having a plan and regularly exercising the plan is tiny compared to a targeted physical mitigation. For instance, building a single flood levee in a single location can cost well over $100m.[32] The cost of having a plan and exercising it is likely to be less than $1m per year. While the cost is low, the impact is high. For instance, in a catastrophic space weather incident, a well-exercised plan could prevent or minimise damage to infrastructure. The absence of a plan could lead to widespread destruction of infrastructure that could take years to repair. Similarly, in the event of a disaster that causes reduced sunlight and resulting crop failure (such as a major volcanic eruption or nuclear winter), in the absence of a plan, large numbers of people could die from famine. With a plan, swift action could mitigate crop loss and empower Australia to increase food exports.

Recommendations

In light of the need for an evidence-based approach to disaster risk reduction, *and consultation questions 1, 2, 3, 4, 7 and 8,* we recommend:

- **Australia should reaffirm its commitment to the all-hazards approach by progressively reforming all plans, strategies and laws that are confined to "natural hazards".**

- **Australia should conduct a national risk assessment that understands risk across all-hazards.** Without a unified picture of risk we can't make good decisions about prioritisation and we can't assess the benefit of mitigations that crosscut multiple hazards. Where a risk assessment finds uncertainty, we should treat that as a cause for concern.

- **Australia should commit to using its national risk assessment as the basis for coordinated whole-of-government and all-hazard prioritisation.**

[32] Flood levee build announced for Bundaberg – Bundaberg Now

Impact-focused prioritisation should apply to:

- **How money is spent, including via the DRF**
- **Which hazards Australia plans for and develops capability for, and**
- **What inventory is held in the national stockpile.**

In light of the risk of catastrophic disasters, and consultation questions 2, 3, 4, 5, 7 and 8, we recommend:

- **Future Commonwealth capabilities should primarily focus on how to mitigate catastrophic disasters.** This is where the risk is, so it should be what the capability is built to address.

- **Future strategy documents should be explicit and specific about how a "shared responsibility model" applies to each catastrophic disaster type.** Good Ancestors' experience is that neither states nor the Commonwealth are taking responsibility for understanding and mitigating potentially catastrophic hazards.

- **Australia should have a plan for all potential catastrophic disaster types, and regularly exercise those plans with all jurisdictions, the private sector and civil society.** Having a well-exercised plan is likely the most impactful single intervention for catastrophic disaster types. Having a plan and exercising it can inform ongoing capability development.
  - Specifically, **Australia should have a civil plan for a nuclear war**. The likelihood of a nuclear war is remarkably high and climbing. The consequence of a nuclear war is orders of magnitude higher than other crises. A plan could save millions of lives and have intergenerational benefits if the worst was to happen.

- **The outcomes of catastrophic disaster exercises should be shared with applicable regulators and policy leaders. Where emergency managers are unable to minimise consequences associated with a hazard, they should communicate the residual risk in detail and collaborate on systematic change.** For instance, if emergency managers aren't ready for a pandemic disease emerging in Australia, they need to detail the risk to state-level biosecurity experts so zoonotic disease can be appropriately mitigated.

- **Plans and exercises should consider both the capability and capacity of the ADF relevant to that catastrophic disaster, and the extent to which that capability and capacity is likely to be called upon for ADF's primary purpose during scenarios with global ramifications.** Nuclear war or global

famine are likely to be the most catastrophic disasters, but are also likely to call upon the ADF to perform their primary mission. We need to build capability that can fill this gap for the most consequential hazards.

In light of shortcomings of the DRF, and consultation questions 3, 4, 5 and 6, we recommend:

- **The Commonwealth should withhold at least 20% of DRF funding and administer it specifically to mitigate national-level catastrophic risks.** This change would contribute to mitigating the neglect of large-scale issues that result from the current structuring of the DRF.

- **Where a state puts forward a DRF proposal that mitigates risk beyond its borders, the assessment of that application should apply a multiplier commensurate with the benefit achieved beyond the jurisdiction.** For instance, if a state's proposal has a positive externality that doubles its positive impact, its assessment score should be doubled.

- **Noting legislation targets the DRF at natural hazards, the assessment of valid DRF applications should also account for their potential benefits and harms against all-hazards.** That is, if a valid DRF application would also mitigate risk from non-natural hazards, that positive externality should be considered.

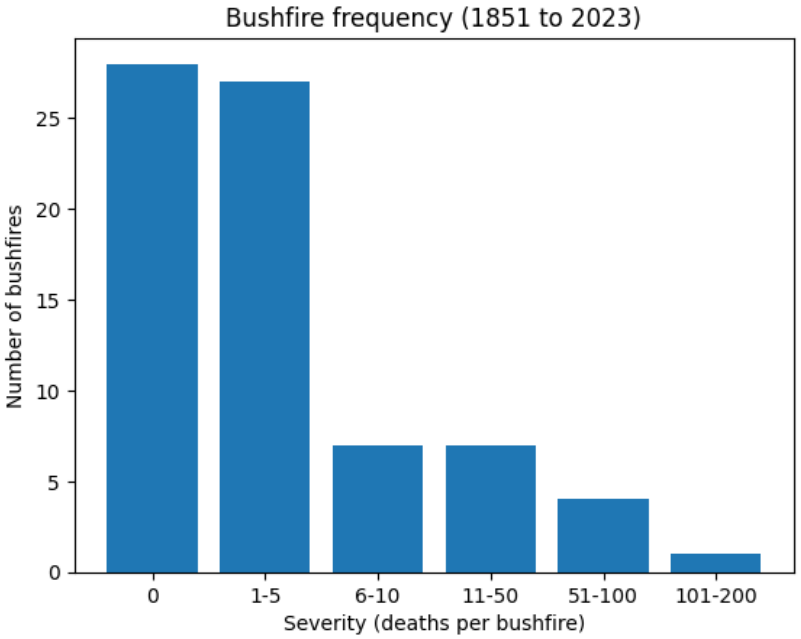
In light of the involvement of charities across the PPRR cycle and across a range of hazards, *and consultation questions 5 and 8*, we recommend:

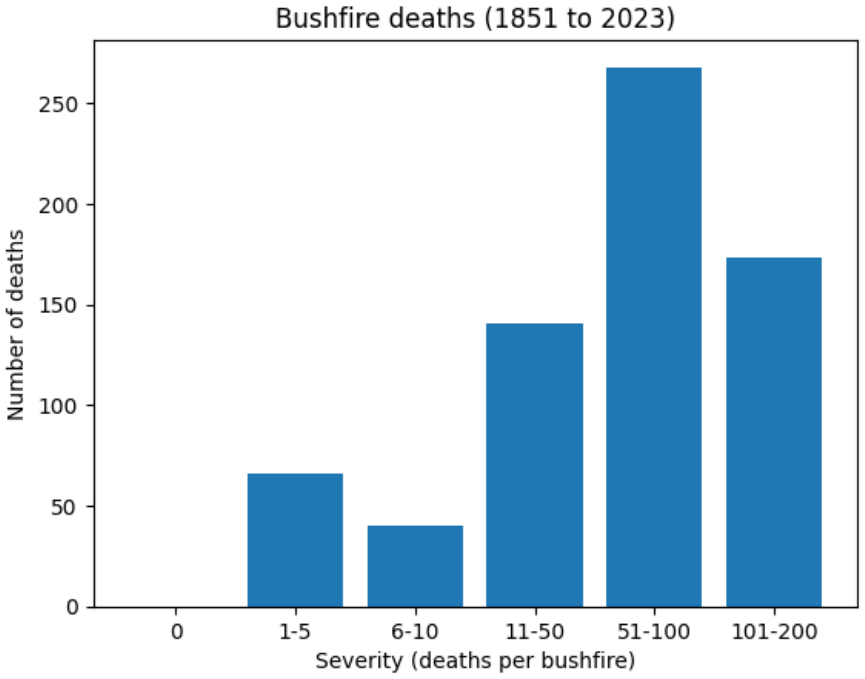
- **All charities with a purpose relevant to disasters should have Deductible Gift Recipient (DGR) status. It's improper that the Government looks to the not-for-profit sector for capability support, but charity law does not treat all these charities equally.** For instance, charities involved in bushfire relief and recovery can accept tax-deductible donations, but charities working to prevent catastrophic disasters and nuclear wars cannot. **Specifically:**

    - **The Department of Home Affairs and NEMA should meet with the Productivity Commission in the context of its ongoing inquiry into philanthropy and ask the Commission to consider expanding DGR status to include all relevant charities.**

    - **Ministers O'Neil and Watt should write to Minister Leigh, in his capacity as the Charity Minister, to communicate the importance of the charity sector to disaster risk reduction and to discuss catastrophic disasters.**

Attachment A - Risk distribution in known datasets





The key contention of this paper is that unlikely but catastrophic disasters represent a significantly greater risk to Australians than more frequent disaster types. Good Ancestors' view is that this position is well supported by the historical record for disasters that have occurred previously (like pandemics) and expert forecasts for newer hazard types (like nuclear war).

This same kind of pattern begins to emerge from analysis within familiar hazard types. While there are many bushfires in Australia each year, most fires are of little consequence. Only a small fraction of bushfires cause widespread damage or fatalities. Of those, a substantial portion of all Australian bushfire fatalities were caused by only three events (Black Saturday, Ash Wednesday and Black Friday).

This analysis of public records of significant bushfires that have caused widespread property damage or deaths shows that a substantial majority of damaging fires caused between 0 and 5 deaths. Despite events that caused over 50 deaths being rare, they are responsible for the substantial majority of harm overall.

While this "micro" observation has fewer implications for Commonwealth capability prioritisation than the "macro" observation of this trend across hazard types, it may aid readers' intuitions about the distribution of risk among hazards. The thing to worry about is the rare big events, not the cumulative risk of smaller events. If the rare big event has a special capability requirement, that's the capability we should build.