

Policy series

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Managing global catastrophic risks

Part 1: Understand

This product is the first in a series. Its purpose is to inform policy-makers at a national level how they can better understand global catastrophic risks. Further products will address how governments can effectively mitigate, prepare for, respond to and communicate about these risks. Visit www.GCRpolicy.com for the online version and detailed policy options.

The risks

- Countries face a set of human-driven global risks that threaten their security, prosperity and potential. In the worst case, these global catastrophic risks could lead to mass harm and societal collapse.
- The plausible global catastrophic risks include:
 - tipping points in the natural order due to climate change or mass biodiversity loss,
 - malicious or accidentally harmful use of artificial intelligence,
 - malicious use of, or unintended consequences from, advanced biotechnologies,
 - a natural or engineered global pandemic, and
 - intentional, mis-calculated, accidental, or terrorist-related use of nuclear weapons
- The likelihood that a global catastrophe will occur in the next 20 years is uncertain. But the potential severity means that national governments have a responsibility to their citizens to manage these types of risks.

The policy problem

- Governments must sufficiently understand the risks to design mitigation, preparation and response measures. The challenge is that national governments often struggle with understanding, and developing policy for, extreme risks.
- Political leaders are inclined to be focused on, or bound by, the short run. Political systems often do not provide sufficient incentives for policy-makers to think about emerging or long-term issues, especially where vested interests and tough trade-offs are at play.
- Additionally, the bureaucracies that support government can be ill-equipped to understand these risks. Depending on the issue or the country, public administrations tend to suffer from one or more of the following problems: poor agility to new or emerging issues, poor risk management culture and practice, lack of technical expertise and failure of imagination.

The policy options

- Some political systems may need structural reform to enable and incentivise the development of policies with future generations and global catastrophic risks in mind. But public administrations do not have to wait for such changes to make headway. Forward-leaning leaders and senior officials can act now to better understand extreme risks, including these global catastrophic risks.
- Governments can take strategic policy efforts to better understand the risks under five broad pillars:
 - **Improve risk management practice** to better understand the existing and emerging risks to national interests from domestic and foreign sources,
 - **Enable better decision-making on futures and risk** to ensure that action is taken within a legislative and policy context,
 - **Understand extreme risks holistically** to sufficiently inform decisions around mitigation, preparation and response measures,
 - **Improve practice and use of futures analysis** to alert policy-makers to emerging issues and facilitate better long-term policy,
 - **Increase government's science and research capability** so that policy problems and solutions are supported by cutting edge technical expertise,

Global catastrophic risks

The human species' ability to cause mass harm has been accelerating since the mid-twentieth century. Global trends in demographics, information, politics, warfare, climate, environmental damage and technology have culminated in an entirely new level of risk.

The risks emerging now are varied, global, complex and catastrophic. And if even only one manifests – whether through nature, accident or intention – it would harm human security, prosperity and potential on a scale never before seen in human history.

The plausible global catastrophic risks include:

- Climate change or mass biodiversity loss that could lead to a tipping point or major discontinuity in the natural order, causing large-scale food, water, health, infrastructure and energy insecurity;
- Artificial intelligence, combined with other advanced technologies, that could be used maliciously against digital, physical or political security;
- Future advances in artificial intelligence that could have harmful global consequences despite having benevolently intended goals;
- Naturally occurring pandemics that have global reach due to increasing human and animal population densities, greater global travel and connectivity, and increased resistance of diseases to pharmaceuticals;
- Advanced biotechnologies, such as synthetic biology and gene editing, that could be used to engineer pathogens and toxins that are released maliciously or unintentionally;
- Advanced biotechnologies that are used for benevolent reasons but accidentally cause large-scale health and environmental damage;
- Use of nuclear weapons – whether intentional, miscalculated, accidental, or terrorist-related – that could lead to mass destruction and potentially catastrophic global cooling from the dust and smoke in the atmosphere;
- Lethal autonomous weapons systems that could intentionally or accidentally identify and target on a mass scale;
- Super-eruptions or impacts of outer-space objects that could lead to catastrophic cooling from dust and smoke that reduces global food production; and
- Cosmic radiation, such as a major solar flare, that could knock out power grids, and satellite and telecommunication networks, impairing food, water, energy and personal security.

Unpredictable and unknowable risks also exist. For example, the individual risks could feed off each other in unpredictable ways. And there could always be previously unseen natural hazards or unimaginable future technologies.

The likelihood that a human-driven global catastrophe will occur in the next 20 years is uncertain, and probably low. But the scale, complexity and severity of these global

catastrophic risks require governments to seriously consider their possibilities and effects.

The policy vision

Governments must sufficiently understand the risks to design mitigation, preparation and response measures. And the risks should be considered as a set. This approach would enable governments to allocate resources depending on how they prioritise the risks. And lessons and knowledge about one risk could be transferable to others. It would also help ensure policy responses for one risk do not exacerbate other risks.

For extreme risks, including global catastrophic risks, national governments should have:

- legislative and policy-making incentives and structures to consider long-term opportunities and challenges;
- an established process to identify, analyse, prioritise and monitor the risks;
- a strong understanding of the government's and nation's contribution to the manifestation of the risks;
- a strong understanding of the possible impacts of the risks to national prosperity, security and potential; and
- well-funded and well-directed risk research to support policy processes (both internal and external to government).

To realise this policy vision, no one model will work best for all governments. A government must consider its constitutional arrangements, political landscape, public constituencies, bureaucratic traditions and national culture.

Governments will also need to decide the level of understanding they believe sufficient to take action. Mitigation and preparation efforts do not rest on a complete understanding of the risks.

The policy problem

The first step in any risk management process is to understand the risks. This step includes recognising what values or assets the entity wants to protect, identifying the risks that could harm those assets and analysing the risks. When analysing a risk, the entity will want to consider the risk's causes, time horizons, likelihood and impacts. The country's existing mitigation efforts and resilience levels will also need assessing.

Extreme risks, including global catastrophic risks, are no different. In fact, efforts to improve understanding are even more relevant given the uncertainty around many of the risks.

The challenge is that national governments often struggle with understanding, and developing policy for, extreme risks.

Of course, not all policy areas are prone to this challenge. National defence establishments, for example, often have the frameworks and processes that facilitate policy decisions for extreme risks. Long-term thinking also influences infrastructure development and monetary

policy. And many countries effectively prepare for and respond to natural disasters and terrorist attacks.

But if policy-makers want to improve understanding of extreme risks, especially global catastrophic risks, they will need to address at least one of the following five problems.

First, many governments struggle to develop policy for issues beyond five or ten years. Political systems often do not provide sufficient incentives to make policy for future issues or consider the impact of current policy on future generations. And short-term political cycles rarely align with the timing of the risks, which can build up and manifest over decades. As a result, political leaders may not have the sense of urgency that these issues call for, especially where existing vested interests and tough trade-offs are at play.

Second, government systems struggle to be agile to new and emerging issues. And they often have little scope or ability to consider future challenges. Existing priorities and limited capabilities tend to narrow the bureaucracies' focus and budget, with little opportunity to shift the system sharply when complex or uncertain issues arise. The rate of global and systemic change across many domains is overwhelming governments' ability to respond.

Third, public administrations often suffer from poor risk management. Government agencies tend to lack the culture, frameworks, training and practice around risk – except some pockets of government, such as national defence. This problem is exacerbated for risks that cut across multiple agencies and layers of government. As a result, governments and their agencies often fail to take ownership. And different parts of the system tackle the discrete subset of the broader policy issue relevant to their agency.

Fourth, technical expertise for extreme risks is often lacking or inconsistent. Aside from defence and civilian research agencies, deep subject matter expertise, particularly on technology issues, tends to reside outside the public sector. This expertise is crucial when improving the understanding of political leaders and senior officials who develop the policies. And engagement with the science community can often be ad-hoc or poorly managed.

Finally, governments, like people, can find it hard to think creatively about the future. Bureaucratic structures are set up for existing problems, and foresight capability is small and nascent. To the extent that futures analysis is conducted, inserting its findings into strategic policy is tough. And futures analysis can be misguided if conducted by civil servants that suffer from groupthink or myopia.

The policy options

Global catastrophic risks, by definition, need global solutions. But national governments can and should take steps themselves.

Fundamentally, one of the government's primary roles is

to protect national security. This gives it responsibility to manage the country's contribution to increasing the likelihood or impact of the risks. It also gives it primacy in improving national efforts to mitigate, prepare for and respond to the risks.

Additionally, in working toward global solutions, progress at a national level could facilitate international agreements. These actions can also set a positive standard and norm for other countries to follow and provide a basis when implementing and regulating global agreements at the domestic level.

Some political systems may need structural reform to enable and incentivise them to develop policies with future generations and global catastrophic risks in mind. For example, countries could consider changes to national constitutions, term lengths and limits, representation in parliamentary bodies, legislative processes, centralisation of policy-making at a federal level, political appointees and election finance.

But public administrations do not have to wait for structural changes. Bureaucracies can make headway on understanding catastrophic risks. Forward-leaning leaders and senior officials can act now to better understand the risks that their countries face.

Quick wins

To understand national and global catastrophic risks, governments must enact strategic policy efforts, options for which are identified in the next section.

However, in some cases, political, budgetary or bureaucratic hurdles may not allow such major policy change. The following actions enable governments to quickly and cheaply improve their understanding of the extreme risks their countries face and begin the process of organising more strategic efforts:

- Commission an independent review of extreme risks, similar to the UK's Blackett Review of High Impact Low Probability Risks
- Conduct analysis to identify mandates and roles of key stakeholders (particularly national, state and local levels of government) for extreme risks and review their capacity to understand, mitigate, prepare for and respond to them
- Stress-test existing emergency response processes for extreme events beyond historical cases through table-top exercises with a view to identifying legislative, policy and process limitations
- Review existing national strategy documents (such as across defence, foreign policy, economics, emerging technologies, critical infrastructure, cyber, counter-terrorism and natural disasters) to understand gaps, overlaps and opportunities for revision and new development
- Conduct review of government's horizon-scanning capability and develop report on major trends identified in existing horizon-scanning products

Overall policy options

Governments must take strategic policy action to improve their understanding of extreme risks, particularly global catastrophic risks. The following list provides a set of options under five broad pillars. These options should be considered in the context of existing national efforts, which will differ by country and by risk type.

Visit www.GCRpolicy.com to see basic and sophisticated versions of each policy option.

Governments must...	To achieve this, governments should...
Improve risk management practice to better understand the existing and emerging risks to national interests from domestic and foreign sources	Develop a risk management process for agencies to manage policy and implementation risks in their portfolio
	Develop a centralised all-hazard national risk assessment process that includes environmental, economic, security, technology, infrastructure and health risks
	Develop a risk prioritisation framework
	Appoint a 'Country Risk Officer' to lead whole-of-government national risk efforts
	Engender risk ownership across government stakeholders
	Build the civil service's knowledge and skillsets around futures and risk
Enable better decision-making on futures and risk to ensure that action is taken within a legislative and policy context	Develop parliamentary mechanisms that consider future generations in the legislative process
	Enable an independent body to shape or design policy for future generations
	Upgrade legislation and processes that underpin responsibilities of government to manage extreme risk
	Develop strategic policy settings through a national risk strategy or white paper
	Incorporate extreme risk into the national security process of Cabinet
Understand extreme risks holistically to sufficiently inform decisions around mitigation, preparation and response measures	Understand the country's contribution and resilience to the manifestation of extreme risks
	Understand the financial implications of extreme risks
	Understand the non-financial implications of extreme risks
	Improve risk data collection and analysis through a centralised system
	Restructure agencies or develop new bureaucratic structures to better respond to cross-cutting issues
	Systematically apply innovative policy-making practices, such as design thinking and structured analytical techniques
Improve practice and use of futures analysis to alert policy-makers to emerging issues and facilitate better long-term policy	Increase and improve futures analysis through a central unit or agency that leads foresight and horizon-scanning activities
	Increase intelligence capability and priority towards extreme foreign risks
	Inject futures analysis into government policy-making processes
	Facilitate network of futures analysis practitioners
	Improve linkages between intelligence, futures analysis and policy
	Broaden engagement with parliamentarians, academia, private sector and civil society
Increase government's science and research capability so that policy problems and solutions are supported by cutting edge technical expertise	Develop in-house science and research on extreme risk
	Improve linkages between science and policy
	Support academic research on extreme risk
	Increase resources in government for science and technology expertise