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GLOBAL SHIELD INSTITUTE

POLICY BRIEF

How governments can better understand global catastrophic risk



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EXECUTIVE SUMMARY

Global catastrophic risk (GCR) has the potential to inflict significant harm to human wellbeing on a global scale. In the most extreme case, all of humanity could face extinction or a state of long-term or irrecoverable collapse. As a result, reducing GCR should be a national and international security priority. In particular, national governments have a responsibility to their citizens to proactively implement policy that would prevent, prepare for and respond to this risk. But the first step is to understand the risk.

Policy vision: Governments must ensure that they sufficiently understand GCR in order to design policies that prevent, prepare for, or respond to the risk. National governments should have a strong ability to identify, analyze and monitor the threats and hazards that could lead to GCR.

Policy problem: National governments often struggle with understanding global risk, and GCR specifically. The nature of GCR as an issue makes it difficult to understand and analyze. Governments can find it hard to think creatively about future and sudden changes to their risk profile. This is exacerbated by the frequent lack of scientific and technical expertise for global risk, including GCR.

Policy options: Governments must better understand GCR and implement structures and processes that enable decision-makers to be more informed about the risk. Governments must improve their understanding of the set of threats and hazards, the vulnerabilities to GCR, and pathways and scenarios of risk. There are four areas in which governments can take action:

- **Risk assessment**: identify and analyze GCR holistically to sufficiently inform policies for prevention, preparedness and response.
- **Futures analysis**: improve practice and use of futures analysis, including horizon-scanning, forecasting and foresight activities, to alert policymakers to emerging threats and trends.
- **Intelligence and warning**: improve intelligence and warning capability on GCR to inform governments on imminent threats and trends in the global landscape.
- **Science and research**: increase government's science and research capability on GCR so that policy solutions are supported by cutting-edge technical expertise.

THE POLICY CONTEXT

Since the mid-twentieth century, global trends in technology, politics, demographics and environmental impact have resulted in an unprecedented level of risk for human society. This global catastrophic risk (GCR) has the potential to inflict significant harm to human wellbeing on a global scale. In the most extreme case, the entire species could be at threat from extinction or permanent collapse.

Global catastrophic threats are those that could inflict significant harm to human wellbeing on a global scale.

Global catastrophic risk is the collective risk that arises from the set of global catastrophic threats.

The human species, as with other natural life, has always faced the risk of global catastrophe from natural hazards, such as supervolcanoes and asteroids. More recently, anthropogenic, or human-driven, threats have emerged and probably represent greater risk than natural hazards. These global catastrophic threats include advanced artificial intelligence (AI), extreme climate change, nuclear winter and engineered pandemics.

The potential for harm posed by these threats means that national governments have a responsibility to their citizens to proactively implement policy that would prevent, prepare for and respond to the risk. But the first step in any risk management process is to *understand* the risk.

In general, prevention aims to reduce the threat or hazard, preparation aims to reduce vulnerability to the threat or hazard, and response aims to minimize harm and recover quickly should a risk event occur.

Governments around the world are beginning to turn greater attention to GCR. For example, the US National Intelligence Council highlighted these threats in their 2020 Global Trends Report:

> "Technological advances may increase the number of existential threats; threats that could damage life on a global scale challenge our ability to imagine and comprehend their potential scope and scale, and they require the development of resilient strategies to survive. Technology plays a role in both generating these existential risks and in mitigating them. [Human-induced] risks include runaway AI, engineered pandemics, nanotechnology weapons, or nuclear war."

And the Secretary General of the United Nations also recognised GCR in his 2021 'Our Common Agenda' report:

> "These risks are now increasingly global and have greater potential impact. Some are even existential: with the dawn of the nuclear age, humanity acquired the power to bring about its own extinction. Continued technological advances, accelerating climate change and the rise in zoonotic diseases mean the likelihood of extreme, global catastrophic or even existential risks is present on multiple, interrelated fronts. Being prepared to prevent and respond to these risks is an essential counterpoint to better managing the global commons and global public goods."

THE POLICY VISION

A policy vision is an ideal state to which policymakers can aspire.

Governments must ensure that they sufficiently understand global catastrophic risk in order to design policies that prevent, prepare for, or respond to the risk. National governments should have a strong ability to identify, analyze and monitor the risk. They must also have a strong understanding of the government's and nation's contribution to GCR.

Global catastrophic risk should be considered as a combined set of threats, hazards and vulnerabilities, enabling governments to allocate and prioritize resources between them. Process and structures for understanding and analyzing risk of national significance should be transferable and applicable to global catastrophic risk.

THE POLICY PROBLEM

The policy problem refers to those causes or reasons for why the policy vision has not been reached. Each national government will have their own unique circumstances. This policy problem attempts to articulate the most common policy problems faced by national governments.

National governments often struggle with understanding national risk, like global catastrophic risk, for three primary reasons.

First, the nature of the GCR as a global challenge and policy issue makes it difficult to understand and analyze. The scale of the risk is unprecedented in human history. Global catastrophic risk impacts human civilization and its future, even threatening human extinction. There is great uncertainty regarding the likelihood, impacts, scenarios and timeframes of the threats. Further, many of the threats are novel and only now emerging on the horizon. Nuclear winter and climate change have been known for decades. But those arising from new frontiers, such as artificial intelligence and synthetic biology, have only recently begun to present catastrophic risk.

Second, governments can find it hard to think creatively about future or sudden changes to their risk profile. Political systems and 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 those that suffer from groupthink or myopia.

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



THE POLICY OPTIONS

Governments must take action to better understand GCR and implement structures and processes that enable decision-makers to be more informed about the risk. A better understanding of GCR includes understanding the set of threats and hazards, the vulnerabilities to GCR, pathways and scenarios of risk, and their factors and implications. There are four areas in which governments can take action:

- Risk assessment: identify and analyze GCR holistically to sufficiently inform policies for prevention, preparedness and response.
- Futures analysis: improve practice and use of futures analysis, including horizon-scanning, forecasting and foresight activities, to alert policymakers to emerging threats and trends.
- Intelligence and warning: improve intelligence and warning capability on GCR to inform governments on threats and trends in the global landscape.
- Science and research: Increase government's science and research capability on GCR so that policy solutions are supported by cutting-edge technical expertise.

The policy options aim to address the policy problems. This set of policy options is not comprehensive nor necessarily relevant for every country. It represents a menu of options that policymakers can take and adapt to their own political and policy context.

QUICK WINS

Some policy efforts might require significant political, financial and bureaucratic capital. Where that capital is not available, governments can take 'quick wins', which represent small but meaningful actions to help governments on the path to more transformational change:

- Commission a review of extreme risk to the nation separate from existing risk assessment processes.
- Map each of the global catastrophic threats against impact on critical infrastructure systems to find gaps and vulnerabilities.
- Conduct a review of the government's horizon-scanning and futures analysis capability.
- Develop a report on identifying key global catastrophic threats and related trends using internal horizon-scanning products and publicly available global risk assessments.
- Allocate technology experts within the intelligence and defense community to conduct ongoing analysis of extreme technological threats, such as engineered pandemics, runaway artificial intelligence and advanced autonomous weapons.
- Conduct a review of current allocation of resources and research efforts to GCR research across civilian and defense science agencies.
- Develop a shared list of policy and research questions between the policy and academic communities focused on GCR.

Risk assessment: Identify and analyze GCR holistically

Policy action 1: Develop centralized all-hazards risk assessment process

Simple option: Develop and implement a regular all-hazards risk assessment process for all threats and hazards to the homeland originating domestically or internationally, ensuring to capture long-term and highly unlikely risk.

Advanced option: Develop a detailed assessment of global catastrophic and existential risk that includes a comprehensive list of potential catastrophic or existential threats, including those threats that may have very low likelihood, as well as technical assessments and lay explanations of the threats, including potential pathways and scenarios.

The simple option is based on the practice of multiple countries according to OECD's 2017 cross-country comparison (see also case study 1).

The advanced option is based on the Global Catastrophic Risk Management Act of 2022.

Case study 1: UK National Risk Assessment

The UK's National Risk Assessment process, run out of the Cabinet Office, is an example that could be adopted by other countries. Since 2008, the biennial review has assessed domestic hazards with the purpose of informing national resilience planning and local-level emergency planning. Separately, every five years since 2010, the National Security Risk Assessment (NSRA) has reviewed security concerns overseas to inform the National Security Strategy and Strategic Defence and Security Review. In 2019, both assessments were combined so that domestic and foreign risks were assessed using a common methodology.

Despite the UK's relatively mature process, the UK's Parliamentary Office of Science and Technology identified challenges and limitations to these assessments, including the focus on short-term acute risk rather than long-term and chronic risk, such as climate change or antimicrobial resistance. The House of Lords published a report in December 2021 that evaluated the UK government's preparedness for extreme risk. It found that the government's focus on risk as discrete threats ignored its interconnected and complex nature. Additionally, the NSRA's reports were published with an unnecessary degree of secrecy, making them impenetrable to outside expert scrutiny and suggestions for improvement. Finally, the assessment was seen to be unsuitable to address chronic risk or high-consequence, low-likelihood events.

In 2021, the UK Cabinet Office Civil Contingencies Secretariat commissioned the Royal Academy of Engineering (RAEng) to review the NSRA methodology. The review made 11 recommendations, many of which RAEng claims have been incorporated into the 2022 NSRA process. In 2023, the UK released its latest National Risk Register based on the upgraded process.

Policy action 2: Understand the country's contribution to the manifestation of global catastrophic risk

Simple option: Map existing government programs according to how they relate to national and global catastrophic risk.

Advanced option: Conduct a review of the actions of all stakeholders – from state and local governments to business sectors and citizens – that contribute to manifestation of national and global catastrophic risk.

These policy options are original to this report. The purpose of these actions is for each country to recognize and analyze how they contribute to GCR, which would inform policy efforts to reduce the risk. Currently, no government study has determined its contributions to GCR. One meaningful effort in this direction is an academic paper that compares how major powers contribute to GCR, such as nuclear war, climate change and AI.

Policy action 3: Conduct a capability and resilience assessment

Simple option: Develop a national capability assessment to understand the capabilities – such as critical infrastructure, emergency services and other national assets – that would reduce impact of nationally significant threats and hazards.

Advanced option: Develop a holistic and regular capability and resilience assessment for GCR.

The simple option is based on similar practices, such as New Zealand's National Capability Assessment and the US's National Preparedness Report, though national capability assessments do not appear to be commonly practiced.

The advanced option is original to this report, but based somewhat on the Global Catastrophic Risk Index.

Futures analysis: Improve practice and use of futures analysis

Policy action 4: Increase and improve futures analysis through central unit or agency that leads regular foresight and horizon-scanning activities

Simple option: Create a futures analysis center in a central government agency that provides support, training and frameworks to other departmental foresight units, leads whole-of-government foresight activities for major policy questions and initiatives, determines the work program in line with the wider agenda, and maintains a database of horizon-scanning products to prevent duplication of effort and to encourage knowledge sharing.

Advanced option: Create a futures analysis agency reporting to the head of government which, in addition to the activities of the central futures analysis center, conducts all-source assessment and policy analysis for GCR, and coordinates with stakeholders inside and outside government.

Both simple and advanced options are based on existing futures, horizon-scanning and foresighting activity practiced around the world (see case study 2).

Case study 2: Futures analysis around the world

Singapore's Centre for Strategic Futures, based in the Prime Minister's Office, is a noteworthy example for horizon scanning for the government. It focuses on potential blind-spot, pursues open-ended long-term futures research, and experiments with new foresight methodologies.

In the UK, the Horizon Scanning Programme team in the Cabinet Office provides a central coordination function for the UK's horizon-scanning efforts, while the Government Office for Science's Futures team supports portfolio-level horizon scanning, conducts futures analysis on cross-cutting and long-term issues, and delivers training and development for civil servants.

This capability provides governments with a way to develop and interpret a range of possible futures. Used in conjunction with risk assessment efforts, these capabilities can help identify new threats, explore future scenarios and reduce uncertainty.

Researchers of existential and global catastrophic risk have commonly used and recommended these techniques, such as horizon-scanning, scenario-building, forecasting competitions and red-teaming.



Policy action 5: Inject futures analysis into government policy-making processes

Simple option: Develop a future analysis toolkit for policy officers and train them on the techniques, and create a small team to broker between foresight producers and policymakers.

The simple option is based on the UK's Futures Toolkit.

Advanced option: Incorporate a mandatory futures analysis process during major policy decisions, supported by a senior horizon-scanning oversight group, which commissions new work, ensures relevant judgements and implications are drawn from horizon-scanning activity, and reports highest priority implications to decision-makers.

The advanced option original to this report, drawing lessons from existing efforts (see case study 3).

Case study 3: Lessons from government futures activities

Futures analysis can be a useful tool because it provides governments with a way to develop and interpret a range of possible futures. Risk managers and intelligence analysts' jobs generally require them to be more conservative and shorter-term in their thinking, but futures analysis exercises can be more conducive environments for speculative or long-term future imagination. So it allows for discussing and mainstreaming the consideration of global catastrophic risk. Based on multiple reviews of foresight activities, linking strategic-level insights with policymaking is a major challenge for most governments that conduct futures analysis:

- One of the widest reviews of foresight and horizon-scanning practice in government was conducted by the European Union Institute for Security Studies in its 2013 yearbook.
- The European Commission's internal expert group, the Research, Innovation and Science Experts, published a report in 2015 on the lessons for policy-making from foresight in countries outside Europe, with a focus on countries in the Asia-Pacific region.
- Leon Fuerth's 2012 report, "Anticipatory Governance: Practical Upgrades", provides a detailed analysis of foresight-policy integration and recommends four broad policy actions: organizing a foresight system, brokering between foresight and policy, incentivising foresight, and training professionals for foresight.
- Switzerland-based think tank, the Center for Security Studies, released a report in 2009 on horizon scanning to inform the Swiss government.

Ideally, futures analysis processes must directly engage senior policymakers, in that they are involved in the thinking, not just receiving the outputs. The question or topic being addressed must be framed by the real-world interests of policymakers and shaped to address an explicit policy need. The policy implications and recommendations should be clearly drawn out, with a mechanism to integrate futures analysis into the policymaking process. To be effective, futures analysis must be well coordinated and implemented across government.

Intelligence and warning: Improve intelligence and warnings capability on GCR

Policy action 6: Devote specific resourcing towards analyzing and warning about existential threats and global catastrophes

Simple option: Develop a standing capability, such as an extreme global threats team, sitting within the central analytical agency to conduct all-source intelligence analysis on current and emerging threats.

Advanced option: Establish an intelligence mission around GCR, with a mission manager that allocates the resources devoted to this mission, coordinates agencies around the topic and presents a central point of responsibility for policymakers.

The simple and advanced options are based on an article in The Bulletin of Atomic Scientists.

Intelligence communities are well-equipped to focus on understanding GCR and informing their decision-makers. Intelligence agencies are generally highly capable and well-resourced parts of government with experience in assessing complex and decentralized threats. However, the focus of intelligence communities tends towards national security, defense and foreign policy issues. Intelligence collection and analysis is targeted towards the most immediate or direct threats, rather than uncertain, highly unlikely or speculative risk.

Policy action 7: Regularly publish intelligence products on issues relating to GCR

Simple option: Produce regular assessments on national security aspects and implications of GCR, such as from extreme climate change, advanced AI, engineered pandemics, near-Earth objects, solar storms, speculative technologies and geoengineering.

The simple option is based on an article in The Bulletin of Atomic Scientists.

Advanced option: Develop a register of global risk with a long-term (say, 20-plus years) outlook along with an annual report to national leaders.

The advanced option is also based on the article, and inspired by the US National Intelligence Council's Global Trends Report.

Policy action 8: Establish GCR monitoring and warning system

Simple option: Develop a set of warnings and triggers within the intelligence analysis agency across a range of global catastrophic threats, and conduct continuous surveillance and monitoring.

The simple option is original to this report.

Advanced option: Establish a National Warning Office.

The advanced option is a proposal suggested by Richard Clarke and RP Eddy (see case study 4)

Case study 4: National Warnings Office

Former senior US national security officials, Richard Clarke and RP Eddy, recommend a National Warnings Office be installed in the White House to focus on possible catastrophes that are not being addressed in other parts of government. Their idea is based on the National Intelligence Officer for Warning, who was the intelligence community's principal advisor on warnings and had a direct line to the White House, but was disbanded in 2009. They recommend that "The office should not address ongoing, chronic problems, such as obesity. Rather, the focus should be on possible impending disasters that are not being addressed by any part of government. The National Warning Office should also work through the interagency and the White House on two institutional goals: first, to create management and decision-making environments that nurture..; and second, to develop a small cadre of people drawn from every cabinet agency to establish processes and information sharing to recognize sentinel intelligence."



Science and research: Increase government's science and research capability on GCR

Policy action 9: Develop in-house science and research on GCR

Simple option: Appoint in each government department or agency a chief science advisor and office with ownership over studying and understanding GCR in their portfolio.

The simple option is original to this report.

Advanced option: Develop a cross-government team from civilian and defense research and science agencies to study domestic and international security and economic effects of GCR, capitalize on and consolidate existing knowledge, and develop and apply methodologies and models to assess risks, vulnerabilities and exposure to all hazards.

The advanced option is original to this report.

Policy action 10: Improve linkages between science and policy for GCR

Simple option: Form an external advisory group to the government on global catastrophic risk that includes key sectors such as health and education, academia, civil society, defense, food, energy, infrastructure, banking and insurance.

The simple option is original to this report, based on similar recommendations, such as in "Risk management in the UK" as well as real-world practice, such as the use of external panels to study Havana syndrome, a disease ailing US spies and diplomats.

Advanced option: Establish an independent body that provides analysis and recommendations on policies relating to GCR.

The advanced option is original to this report, based on practice in other policy areas (see case study 5).

Case study 5: The UK's science-policy linkages

The UK is a world leader in improving the linkages between science and policy. The UK government has a network of departmental chief scientific advisors (CSAs), led by the Government Chief Scientific Advisor (GCSA). No less than 26 other departments and agencies have CSAs. The GCSA also chairs the Council for Science and Technology, which is the Prime Minister's independent advisory body on cross-cutting science and technology issues. Its members are leading figures in the science, technology, academic and business community. The Parliamentary Office for Science and Technology (POST) provides in-house support and analysis to the UK parliament on public-policy issues related to science and technology. POST publishes short and long form briefs for parliamentarians, conducts horizon-scanning activities and supports linkages between parliament and the academic communities. Scientific advice permeates into the policy-making space as well via groups like the Committee on Climate Change, which is an independent statutory body that advises the government on all aspects of policy relating to emissions targets.

Policy action 11: Support academic and scientific research on GCR

Simple option: Provide funding to external advisory groups, centers or institutes that study the science of GCR to conduct policy-driven research.

The simple option is original to this report.

Advanced option: Develop a standing capability with academics and researchers to conduct joint research on GCR.

The advanced option is inspired by similar efforts, such as a report that was jointly produced by The Alan Turing Institute, the Centre for the Study of Existential Risk and the Defence Science and Technology Laboratory of the UK Ministry of Defence.

About this report

This policy brief was developed by Global Shield's policy team, led by cofounder and Director of Policy, Rumtin Sepasspour. It is the first in a series on how governments can reduce global catastrophic risk. Other briefs in the series will cover how governments can better govern, prevent and prepare for global catastrophic risk. The policy brief was first published in August 2023 and was updated in July 2024 with minor changes to policy actions and case studies. The policy actions in this brief were identified and developed based on academic research, world's best practice, and Global Shield's internal policy research, development and diffusion (RDD) process.

About Global Shield

Global Shield is the world's first international advocacy organization devoted to reducing all-hazards global catastrophic risk (GCR). We work with governments worldwide to enact policies to better understand, prevent, prepare for, and respond to global catastrophes, regardless of the threat that may produce them. We believe an all-hazards policy approach to addressing GCR can ensure governments are effectively shielding all of us from global catastrophes. At Global Shield, we envision a world in which all governments have acted decisively to reduce and, where possible, eliminate global catastrophic risk. Our mission is to ensure countries around the world enact and effectively implement policies that reduce global catastrophic risk.

