GLOBAL SHIELD

How governments can better understand global catastrophic risk

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Executive summary

Global catastrophic risk (GCR) has the potential to inflict significant damage to human security, prosperity and wellbeing on a global scale. In the most extreme case, the entire species could be at threat from extinction or permanent collapse.

The potential for harm posed by global catastrophic 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 is to understand the risk.

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

Policy problem: National governments often struggle with understanding extreme risk, and global catastrophic risk specifically. The nature of the GCR as an issue makes it difficult to understand and analyze. Governments can find it hard to think creatively about the future. And scientific and technical expertise for extreme risk, including GCR, is often lacking or inconsistent.

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 global catastrophic risk 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 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 damage to human security, prosperity and 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 has always faced the risk of global catastrophe from natural hazards, such as supervolcanoes and asteroids. More recently, anthropogenic or human-driven threats to humanity have emerged and probably become a greater risk. These global catastrophic threats include advanced artificial intelligence, 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 risks in their 2020 Global Trends Report:

Every four years, the US Intelligence Community releases a flagship report for the incoming Presidential administration to identify and analyze key trends, risks and factors in the global landscape.

> "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."

But more work is needed for governments to better understand the risk and turn that understanding into policy action.

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 set of threats, enabling governments to allocate resources depending on how they prioritize between them. 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.

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 extreme risk, and global catastrophic risk specifically. Three primary reasons drive a poor understanding of this issue.

First, the nature of the GCR as an 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, and, at worse, threatens human extinction. There is great uncertainty regarding how these risks unfold, how likely the scenarios are, and when the risks could occur. And many of the threats are novel and only now emerging on the horizon. Threats such as nuclear winter and climate change, for example, have been known for decades. But some technology-based threats, such as artificial intelligence and engineered pandemics, do not yet pose catastrophic risk.

Second, governments 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 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. 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.

The policy options

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- Risk assessment**:** identify and analyze GCR holistically to sufficiently inform policies for prevention, preparedness and response.
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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

The following actions enable governments to quickly and cheaply improve their understanding of GCR:

- Commission a review of extreme risks, similar to the UK's Blackett Review of High Impact Low Probability Risks in 2012;
- 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 capability, similar to the UK's review of cross-government horizon scanning in 2013
- Develop a report on major trends identified in existing horizon-scanning products relevant for GCR.
- 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 on global catastrophic risk, similar to the "80 questions for UK biological security"

The main policy options in the remainder of the report will require political, financial and bureaucratic capital. Where that capital is not available, these quick wins represent small but meaningful actions that could help governments on the path to more transformational change.

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, including a comprehensive list of potential catastrophic or existential threats, including even those that may have very low likelihood, as well as technical assessments and lay explanations of the risks, 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 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 probably the most mature form of all high-income countries. Since 2008, the biennial review has considered domestic hazards, with the purpose of informing national resilience planning and local-level emergency planning. Separately, since 2010, the five-yearly National Security Risk Assessment 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 against a common methodology.

Despite the UK's world-leading process, the UK's Parliamentary Office and Science identified further challenges and limitations, including the focus on short-term acute risks rather than long-term and chronic risks, such as climate change or antimicrobial resistance. The House of Lords published a report in December of 2021 which evaluated the UK government's preparedness for extreme risks. It found that the government's focus on risks as discrete, rather than interconnected, was ignorant of their complex nature. Additionally, the NSRA's reports are published with an unnecessary degree of secrecy that makes them impenetrable to outside expert scrutiny, which would only improve them. Finally, the assessment continues to be unsuitable to address high impact low-likelihood risks and chronic risk events.

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

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

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

Advanced option: Conduct a review of actions of all stakeholders - such as state and local governments, 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 artificial intelligence.

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 policies in some countries (see case study 2), though national capability assessments do not appear to be commonly practiced. When conducted, they do not adequately consider GCR.

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

The US National Preparedness Report "summarizes progress made, and challenges that remain, in building and sustaining the capabilities needed to prevent, protect against, mitigate, respond to, and recover from the threats, hazards and incidents that pose the greatest risk to the nation."

Case study 2: Capability and vulnerability assessments

National capability assessments are conducted by some countries in order to understand their capabilities and vulnerabilities to inform efforts for building national resilience. For example, under Presidential Policy Directive-8, the US government is required to prepare an annual National Preparedness Report. Similarly, New Zealand has previously conducted a National Capability Assessment to identify strengths and weaknesses, any trends in capacity and capability, and gaps or areas for improvement.

The Global Catastrophic Risk Index, first released in 2022 by the Global Governance Forum, attempts to quantify the overall vulnerability of 118 countries to GCR. However, the seven aspects that the composite index includes - economic stability, quality of governance, education and skills, gender equality, business environment resilience, environmental vulnerabilities, and exogenous vulnerabilities - do not appear to empirically or rigorously assess such vulnerability.

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.

Both simple and advanced options are based on existing futures, horizon-scanning and foresighting activity practiced around the world (see case study 3).

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.

Case study 3: Futures analysis around the world

Singapore's Centre for Strategic Futures, based in the Prime Minister's Office, is a world leader in horizon scanning for government. It focuses on issues that may be blind-spot areas, 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. For example, researchers from the Future of Humanity Institute recommend 'regular horizon scanning', to identify unknown threats, and also to set up organizations in such a way that they regularly and promptly receive this information.

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 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 4).

Case study 4: Lessons from government futures activities

Linking strategic-level insights with policy-making is a major challenge for most governments that conduct futures analysis, based on multiple reviews of foresight activities.

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.

In January 2013, the UK Cabinet Office published a review of cross-government horizon scanning, led by the Chairman of the Joint Intelligence Committee Jon Day.

Switzerland-based think tank, the Center for Security Studies, released a report in 2009 on horizon scanning to inform the Swiss government.

The Institute of Risk Management provides a practical guide for risk managers to conduct horizon scanning.

In the US, according to one 2018 report, many agencies did not have formal processes for integrating the results of futures analysis into policy planning or management processes. A few agencies — such as the Veterans Affairs, US Coast Guard, US Air Force, National Geospatial-Intelligence Agency and the Environmental Protection Agency — were able to incorporate foresight work into the organization's strategic planning process. But foresight in other agencies remained fragile, immature and limited in its influence.

Intelligence and warning: Improve intelligence and warnings capability on global catastrophic risk

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, intelligence communities are typically security-focused and deliver intelligence advice based on customer requirements, with political and military leaders as key customers. 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.

A dedicated intelligence capability towards extreme global risk, particularly GCR, could be a small team or as a whole-of-community mission. It would ensure that long-term, uncertain, highly unlikely or emerging threats are being adequately investigated.

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 extreme climate change, advanced artificial intelligence, engineered pandemics, near-earth objects, solar storms, speculative emerging technologies and geoengineering.

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

Advanced option: Develop a global risk register 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 somewhat by the US National Intelligence Council's Global Trends Report released every four years.

Policy action 8: Establish GCR monitoring and warning system

Simple option: Develop a set of warnings and triggers within the central intelligence analysis capability 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, who recommend a 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, which was the intelligence community's principal advisor on warnings and had a direct line to the White House, but was disbanded in 2009.

Strategic warning is an important capability for any intelligence community and might require specialist expertise, dedicated resourcing and non-traditional reporting lines.

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 department 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 government on extreme and 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 a independent body that provides independent analysis on policies relating to GCR.

The advanced option is original to this report, based on similar 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 technology 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. And scientific advice permeates into the policy-making space too, such as 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 group or centers and institutes that study the science of global catastrophic risk 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 joint report 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 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.