# Recognising and Preparing for Existential Threats

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any people, organisations and decision-makers, and the professionals who advise and support them, overlook the fragility of the conditions on earth that support contemporary lifestyles, communities and societies, and the narrow range of variability within which they remain

viable<sup>1</sup>. In addition to activity, business and context related risks that people and organisations may monitor and seek to mitigate, there are background global risks<sup>2</sup>. Currently, there are also an unprecedented number of existential threats that could have catastrophic consequences for social and economic While the chances of disasters happening can vary depending upon the threat, and in some cases may seem remote, the probability of one or more such events of some form occurring in the lifetime of many of those living today is uncomfortably high.

systems. While potentially devastating for many people, they may be accompanied by opportunities for the agile, flexible and entrepreneurial to protect others from some of their impacts.

Options for dealing with certain very low probability risks such as collision with an asteroid that could be potentially catastrophic have been considered<sup>3</sup>. Who should do what to identify, assess, monitor and prepare for various other existential threats? How should these activities and corporate and collective responses be initiated, managed and/or coordinated and funded? While some people may be aware of them and personally concerned about them, existential threats infrequently feature on board, council and cabinet agendas. Nor are they priorities for innovation to the extent that perhaps they should be. Our survival depends upon our understanding of existential threats, and our individual, organisational, community and wider collective responses to them.

This article primarily concerns selected risks and threats that pose a significant danger to human life with the potential for large numbers of casualties, and which might significantly affect the livelihoods, lifestyles, contexts and prospects of those who survive their first or early impacts. Words such as disaster and catastrophe could be used to describe their actual, likely, potential or later outcomes, yet they may not feature on some risk registers and heat maps. Certain risks and threats that may not yet be regarded as existential for humans are already proving terminal for many other species. For us the worst is yet to come.

#### **Existential Threats and their Consequences**

Humanity now faces multiple existential threats, and a range of outcomes are possible. While they may be hard to predict,

catastrophes and disasters have occurred throughout human history. Societies and their governing arrangements have often been ill prepared to cope with them<sup>4</sup>. When unexpected crises happen, flexible and dynamic rather than bureaucratic responses are often required. Our prospects may depend upon whether we think short-term, engage in polarising debates, are pessimistic and use alarmist rhetoric, or harness the potential of science and technology by thinking rationally, globally, collectively and optimistically about the long-term<sup>5</sup>.

Whether or not a threat is considered as existential and by whom depends upon attitudes and perceptions. Who or what could be impacted, where, when, for how long and/or to what extent? A threat that may prove terminal for the viability and continuation of certain groups, species or activities in some situations, circumstances, contexts and locations, might be initially viewed as a minor inconvenience by others. A stoppage described as an emergency or crisis in one context, may be considered a temporary interruption elsewhere.

While the chances of disasters happening can vary depending upon the threat, and in some cases may seem remote, the probability of one or more such events of some form occurring in the lifetime of many of those living today is uncomfortably high. Many people, organisations, communities and their infrastructures are at risk of being severely impacted by certain threats. Various individuals and entities could possibly have a key role to play in preparing for worst case outcomes and activities to increase organisational, community, societal and collective resilience. There are many existential threats and their possible antidotes to consider.

#### **Nuclear Weapons and Threats**

The threat of development, deployment and use of nuclear weapons endures. Early fission weapons or atomic bombs have long been superseded by massively more destructive fusion ones or hydrogen bombs. The risk of mass destruction and death is ever present, whether initiated by accident, nuclear terrorism or system failure, or by a deranged, impulsive or suicidal action, an AGI application, or because deterrence or controls fail to prevent an initial catalytic attack, retaliatory responses and further escalation. There are continuing risks of nuclear proliferation, and the possibility of nuclear weapons being put into earth orbit at a time of limited consensus or cooperation on how to deal with them<sup>6</sup>.

Thousands of nuclear weapons exist. Once launched, their delivery vehicles can be difficult or impossible to stop. Arsenals are designed to be resilient, resistant to interference and to deter. Multiple emergences and 'near misses' have occurred. At times, such as the Cuban missile crisis, there has been a heightened risk of nuclear conflict. More attention seems to be devoted to modernising and testing weapons systems than mitigating the risks of their existence and possible misuse. Russia continues to modernise and refresh its strategic and non-strategic nuclear arsenal and air, ground and sea launched delivery systems<sup>7</sup>. The possible use of nuclear weapons has been suggested by President Putin during certain stages of Russia's invasion of Ukraine. His country retains tactical nuclear weapons and Russian doctrine allows for their use in certain circumstances.

Arms control agreements have frayed. Geopolitical tensions and faultlines are at a heightened state. Underground bunkers and past plans to delegate responsibilities to networks of alternative public governance arrangements have been abandoned in certain countries but retained in varying states of readiness elsewhere. It had been hoped that 'cold war' preparations would enable some people to survive at least for a period. Information leaflets were distributed to make them aware of the consequences of nuclear war, and subsequent risks to life and health. Recreating equivalent levels and forms of protection today could be controversial, very costly and possibly alarming for many people.

# **Biosecurity Risks and Threats**

Biological and chemical weapons, as well as nuclear ones, could be used by state actors or terrorists, including for blackmail. Certain options might be affordable for non-state actors and malevolent individuals and gangs. Human societies have been under the threat of pandemics for millennia. They can arise from natural events, human interaction with other species, and genetic research, development and bioengineering. The risks of laboratory misuse, accidents, inadequate safety measures and defective protective arrangements are ever-present<sup>8</sup>. As with other existential threats, cooperation is required for effective preparation and responses. A challenge for business, political and other decision-makers in a divided and fracturing world is to identify and understand where and how competition and confrontation can coexist with cooperation<sup>9</sup>.

Biosecurity risks and threats can arise at any time. Pathogens known and unknown exist widely and can occur in suspected and unexpected places. They can and do cross over between species. In certain sectors such as livestock farming, those with operations may need to be prepared for outbreaks and ready to adopt controls introduced by relevant authorities. Personal protective equipment (PPE) can have a shelf life. Corporate and public policies should ensure existing stocks are not beyond their 'use by' dates and arrangements are in place for their supply in the event of an outbreak or pandemic.

# **Biosecurity Vulnerability and Preparedness**

Greater mobility and travel can speed up the transmission of pathogens. The Covid pandemic revealed how unprepared most countries were, the inadequacy of much decision-making, and how undervalued and underfunded some processes and systems for dealing with it were. Future viruses might be more transmissible and virulent. Panic, fear, failure to take precautions, inadequate control measures, or a breakdown of law and order resulting from one existential threat, and activities to take advantage of them, could unleash others.

Biological risks and threats have long been recognised. They have also been experienced in localised and global pandemic forms. Both biological and chemical weapons have been researched and used, and steps have been taken internationally to limit and control them. Following the Covid pandemic, the World Health Authority agreed in December of 2021 to initiate discussions on a new international agreement to cover cooperation and responses to future pandemics. These could include PPE, the cost and inconvenience of which can be significant, but bearable for organisations and societies in certain contexts, and with some occupational groups in comparison with the consequences of losing those they protect.



#### **Global Warming and Climate Change**

Melting ice sheets and glaciers, rising sea levels and greater frequency of extreme weather events such as floods and wildfires increase awareness of global warming. The World Meteorological Organisation (WMO) has reported a year and decade of record high average global temperatures<sup>10</sup>. Scientific monitoring and assessments predict further increases and their climate impacts are likely to become worse before they improve. Our collective responses to date suggest we will not move quickly enough to avert multiple crises and disasters, including famines, mass migrations and/or relocations as areas are abandoned or inundated and infrastructures fail. Widespread disorder and conflicts could result.

Climate change can give rise to both new and aggravated risks and longer-term existential threats, for which individual, organisational, community, societal and international responses might be possible, desirable and justifiable. These risks and threats also create myriad opportunities. Action is underway, but more needs to be done, collaboratively and quickly. Many scientists fear that current efforts will not prevent the triggering of remaining tipping points and negative feedback loops, such as methane released from melting tundra, that accelerate further global warming until it becomes uncontrollable<sup>11</sup>.

While climate change may not result in a biological or radioactive substance that could be transported, it might create targets for a malevolent actor such as sea or flood defences. These may already be under pressure from higher water levels. Existing practices such as burning crops are already causing premature deaths and exacerbating warming. As temperatures rise and people lose hope, some of the disadvantaged may revolt, conflicts might occur, and public order could break down. There may be steps that could be taken to improve indoor air quality, and further collective action that could reduce external pollution. Climate adaptation and mitigation create opportunities for alternatives, reinvention and increasing resilience.

#### Artificial Intelligence and its Regulation

As people rush to adopt them to avoid being left behind, Al capabilities are developing faster than our ability to monitor, control and regulate them. They give rise to multiple risks with societal-scale impacts<sup>12</sup>. While AI applications that advantage some people and interests may be transformational, the use of both Generative AI and artificial general intelligence or AGI by

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naïve and 'bad actors' could have catastrophic consequences, ranging from weaponisation to loss of control over advanced systems<sup>13,14</sup>. For many adopters, the prospects of benefits override their concerns about misinformation, the undermining of elections and democracy by deepfakes, the threat to life of bioterrorism, or risks such as that of autonomous and uncontrolled actions.

Companies operating within the European Union (EU) are already subject to requirements which over time will or may influence customer expectations. Given the rapid spread of AI and Generative AI adoption, application and experience, similar provisions may soon be introduced in other jurisdictions. At minimum, a responsible company might wish to ensure that outputs from its applications of AI are identified as having been AI generated. It would be prudent to avoid putting AI offerings into the marketplace that could expose others to unacceptable or unreasonable levels of risk. Appropriate warnings could be provided.

Governments face difficult choices about legislative, regulatory and financial priorities, and many decision-makers face capacity and capability constraints. Given that human inventiveness and activity are the cause of multiple existential risks, might a future autonomous AGI application act against us? Corporate AI/AGI policies and guidelines should responsibly address the challenge of preventing disaster and misuse by others without becoming an unreasonable constraint on progress. Action plans could be developed to increase the safety and security of advanced AI<sup>15</sup>.

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# **Existential Threat Governance**

The potential impacts of existential threats are often global. Wherever possible, early warning signs should be identified and monitored. From space it is possible to obtain an overview of our changing planet and look more closely at areas of concern. There are a variety of possible applications of space-airground monitoring technology that could be used for natural resources, environmental management, geological and climate and weather disaster monitoring<sup>16</sup>. Existing governance arrangements have been unable to prevent certain challenges to international order and contraventions of the UN Charter. What form of integrated framework might strengthen multi-lateral governance mechanisms to prevent and reduce risks and address existential threats?<sup>17</sup>

Threat levels are increasing. Trends such as global warming and geopolitical regrouping continue. A common feature of existential threats is the opportunities they create for 'bad actors' with malevolent intentions such as terrorists or criminals, either for destructive purposes or for blackmail. The polarisation that is occurring in many societies, exacerbated by targeting and the use of some AI applications, is increasing their potential misuse<sup>2</sup>. Various delivery mechanisms, such as the availability of affordable load carrying drones are democratising their possible applications and abuse.

# **Confronting Threat Governance Challenges**

Public bodies are often constituted to deal with emergencies and respond to symptoms of crystalising risks and existential threats rather than address their root causes, which may require public-private collaboration and collective responses. Leaders and boards should be open to mutually beneficial cooperation to prepare for challenges, cope with them, and be ready to grasp any opportunities that may accompany them. Due to staff turnover and retirements, system updates and corporate retention and disposal of documents policies, little may remain of past arrangements to deal with high impact events.

Memories are sometimes short, especially in many democracies. Lessons can be quickly forgotten as events and people move on and new issues and preoccupations emerge. With other claims upon their time and available resources, corporate and government decision-makers may seem reluctant to invest in precautions that might save some lives in scenarios such as a nuclear accident or terrorist attack. Such measures



may be easier to introduce in an autocracy where a longer-term view is taken and eventual conflict is regarded as likely.

In democracies and competitive markets, decision-makers can be concerned with more immediate issues. They may find it difficult to prepare for events and eventualities whose timing is difficult to predict, and be reluctant to raise them with electorates, investors or other stakeholders. Available time is often devoted to matters on which urgent decisions are required. When under pressure, perspectives may narrow and longer-term risks and trends, and existential threats, put onto the back burner.

# Handling Diverse Existential Threats

Diverse existential threats may require access to many disciplines and sources of scientific research. Increasing the number of external experts asked to consider existential threats can multiply the relationships a company, or group of collaborating entities, may have to manage, and additional teams and/or task forces might be required to understand and prepare for selected scenarios. At universities, multi-disciplinary research is increasingly encouraged. Their role in relation to sustainability and the complex and many faceted challenge of climate change has been questioned, and a plurality of approaches suggested<sup>18</sup>. Existential risks come in various forms. They may initially be experienced in less than a total or worst-case manifestation. There might be preparations that could be undertaken and corporate and collective responses that would reduce their adverse impact. Bulk buying through collective purchasing and shared storage and/or maintenance arrangements may reduce some unit costs. These could be affordable in comparison with certain existing per-head and total expenditures by health systems, when the number of people who might benefit are considered. Some executives may worry about the implications of the cost of existential threat precautions and preparations for the pricing of a company's offerings in competitive markets. Would people pay a premium for extra protection, resilience or safety?

# Possible Collective Responses

Individual entities may not be able to tackle large scale and complex emergencies alone. Does this create a moral responsibility for coordination, collaboration and joint action?<sup>19</sup> Some people and organisations may be aware of certain aspects of existential threats and where support might be available to address certain of their impacts, while largely unprepared for others. For example, climate change has been recognised as the biggest contemporary health threat, and primary and community care could play an important role in climate adaptation and the protection of vulnerable groups<sup>20</sup>.

There are protective measures that could be considered against destructive attacks and their costs could be compared with those of recovery, replacement, or inconvenience while a resource, facility or infrastructure is unavailable. Some risks may be insurable, but as their frequency increases others may become unaffordable and/or uninsurable. When reviewing responses to existential threats, decision-makers and their advisers should look beyond physical safety and the vulnerability of processes and systems. As mental health issues increase, how much might people pay for greater peace of mind and psychological safety?

#### **Increasing Awareness and Preparedness**

Policies and arrangements could be put in place to deal with existential risk related and blackmail threats. Discussion of certain existential challenges may increase awareness of the impacts of existing contextual factors such as environmental pollution and the importance of air quality for human health and wellbeing. Crop burning may be a convenient option for rural farmers, but could circular economy use of waste, including for power generation, represent a business as well as an environmental opportunity?

There are many issues and questions that people in positions of authority could address. Have they and those who advise and support them considered vulnerability to global risks and existential threats? While these may impact most entities, are some more likely than others to be impacted or sued? Who and what activities and operations might be adversely affected and where and when? A matrix could present an overview of the potential impacts of threats for an entity and its stakeholders, their duration, what steps are underway or could be taken to mitigate them, cope or recover, and compare their costs with estimates of possible harm.



# **Understanding Challenges and Vulnerabilities**

While taking steps to mitigate and insure against a variety of risks, people and organisations usually have much less awareness of existential threats and little if any experience of preparing for them. They may not know enough to even discuss them, let alone assess and prioritise them and allocate resources to handling them. Those who are better informed about the harmful health impacts of climate change are more likely to prioritise climate action over economic growth and act on climate solutions, and less likely to agree that the costs of climate action are too high<sup>21</sup>. It helps if all parties and key players have a common and consistent understanding of risks, possible impacts of existential threats, areas of vulnerability, and preferred responses to possible scenarios. Some communities and locations such as poorer areas may be more vulnerable than others<sup>22</sup>.

Strategies to increase resilience may be incomplete if consequences of certain risks and existential threats are not considered. As they can drive innovation, overlooking them can result in missed opportunities. Slow-burn risks, emerging crises and existential threats can prolong the imperative for innovation. People who realise that continuing as before is neither desirable nor possible, may be more open to ideas and possibilities. Certain processes may need to be speeded up, for example by undertaking activities in parallel rather than sequentially. A diversity of perspectives can be helpful when exploring possible responses.

# Reviewing and Testing Roles and Responsibilities

Organisational, community and public institutional structures and allocations of roles and responsibilities do not always match the challenge represented by different existential threats and may be dysfunctional. Potential key players whose collaboration is sought may feel an event, risk or threat does not fall within their current role or departmental responsibilities. Steps may need to be taken to ensure that considerations and impact costs outside of the remit of involved public bodies are not overlooked<sup>23</sup>.

A shared understanding of roles and responsibilities and to whom organisational, community and Government responsibilities and authority might be delegated in crisis and emergency situations is also advisable. Such arrangements may need to be reviewed as existential threats evolve. Should executive and leadership development programmes also have a module on existential threats, with exercises involving the identification and ranking of an entity's exposure and suggestions about steps that could be taken to increase resilience?

The responses of those in authority and senior staff to certain existential threat scenarios could be periodically tested. Incidents and events may be accompanied by malevolent actors seeking to take advantage as well as those needing help and support. Choices may have to be made between protecting lives and/ or vital assets and corporate and/or community resources and infrastructures. Seeing how individuals and groups respond and interact in exercise scenarios can be very revealing. Outcomes can sometimes be unsettling. For some entities the greatest risk may be how their leadership teams react to adversity.

#### Confronting Consequences of Human Behaviours

Many existential threats result from human aspiration, ingenuity and inventiveness. Collective human activities are resulting in a mass extinction of other life forms. They are degrading the earth's ability to support a growing population of people and their expectations. Scientific and technological advances can expose humanity to risks and threats that could be existential and already have been for some people and other species<sup>8</sup>. The widespread yearning for more, new and better is threatening our collective prospects.

The time that may be available to prepare for existential threats and respond to them varies. Reviews of purpose, mission and priorities for the period of available windows for reaction before it is too late are necessary. These could cover capabilities, connections, accessible resources and potential collaborations. Responsible and caring leaders might prepare for possible emotional and behavioural responses to threats and think about their own roles and the help and support that key executives and others might require in crisis situations.

People and organisations concerned with research and development and corporate, community and Government decision-makers, individually and collectively, should devote more time, finance and other resources to ways of identifying, assessing, monitoring and coping with potential existential threats and their possible impacts, and putting the case for recognising, understanding and preparing for them<sup>3</sup>. Doing

things differently is now a pressing imperative. Human creativity and innovation should be focused on less resource intensive and more responsible alternatives and ensuring our survival.

#### References

- 1. Mann, Michael E. (2023), Our Fragile Moment: How lessons from the Earth's past can help us survive the climate crisis, London, Scribe Publications.
- 2. WEF (in collaboration with McKinsey and Company) (2024a), The Global Cooperation Barometer, Insight Report, Cologny, Geneva, World Economic Forum, January.
- 3. Ord, Toby (2020), The Precipice: Existential Risk and the Future of Humanity, London, Bloomsbury.
- 4. Ferguson, Niall (2021), Doom: The Politics of Catastrophe, New York, NY, Penguin.
- 5. Rees, Martin (2018), On the Future: Prospects for Humanity, Princeton, NJ, Princeton University Press.
- CFR (2023), Nuclear Proliferation, New York, NY, Council on Foreign Relations (CFR) [https://world101.cfr.org/global-eraissues/nuclear-proliferation]
- Kristensen, Hans M., Korda, Matt, Johns, Eliana and Knight, Mackenzie (2024), Russian Nuclear Weapons, 2024, Bulletin of the Atomic Scientists, Vol. 80, Issue 2, 7th March, pp 118-145 [DOI: https://doi.org/10.1080/00963402.2024.2314437]
- Wade, Nicholas (2021), The Origin of COVID: Did people or nature open Pandora's Box at Wuhan? Bulletin of the Atomic Scientists, May 5th [https://thebulletin.org/2021/05/ the-origin-of-covid-did-people-or-nature-open-pandoras-box-atwuhan/]
- 9. WEF (World Economic Forum) (2024b), The Global Risks Report 2024, 19th Edition, Cologny, Geneva, World Economic Forum, 10th January.
- WMO (2024), State of the Global Climate 2023 (WMO-No. 1347), Geneva, The World Meteorological Organisation (WMO), 19th March.
- 11. UNEP (2023), Emissions Gap Report 2023, Broken Record: Temperatures hit new highs, yet world fails to cut emissions (again), 20th November, Nairobi, United Nations Environment Programme (UNEP).
- 12. CAIS (2023), 2023 Impact Report, San Francisco, CA, Centre for AI Safety (CAIS).
- 13. GOS [Government Office for Science] (2023), Future Risks of Frontier AI, Which capabilities and risks could emerge at the cutting edge of AI in the future? London, Government Office for Science, October.
- 14. HM Government (2023), Safety and Security Risks of Generative Artificial Intelligence to 2025, London, HM Government, 26th October.
- 15. Gladstone AI (2024), Defense in Depth: An Action Plan to Increase the Safety and Security of Advanced AI, March, Alexandria, VA, Gladstone AI [https://www.gladstone.ai/ action-plan]
- 16. Liu, Xiayu (2023), Applications of Space-Air-Ground Integrated Monitoring Technology in Resource and Environment Management, Paper delivered at 2nd International Conference on Artificial Intelligence and Computer Information Technology (AICIT - 2023), 1-5, September.
- Nurse, Joanna (2023), Human Security and Existential Threats: A Governance Framework for Planet, Peace, People & Prosperity, Cadmus, August, Vol. 5 Issue 2, pp 192-211
- Stein, Sharon (2024), Universities confronting climate change: beyond sustainable development and solutionism, Higher Education. Vol. 87 Issue 1, January, pp 165-183

Public bodies are often constituted to deal with emergencies and respond to symptoms of crystalising risks and existential threats rather than address their root causes, which may require publicprivate collaboration and collective responses.

- 19. Erskine, Toni (2022), Existential threats, shared responsibility, and Australia's role in 'coalitions of the obligated', Australian Journal of International Affairs. April, Vol. 76 Issue 2, p130-137.
- Litke, Nicola Alexandra, Poß-Doering, Regina, Fehrer, Valeska, Köppen, Martina, Kümmel, Stephanie, Szecsenyi, Joachim and Wensing, Michel (2024), BMC Health Services Research, Vol. 24 Issue 1, February 9th, pp 1-10.
- Bliss, Jesse, DeVito, Roseanne, Bare, Gina, Labbo, Becky, Tariq, Reem, Chang, Amy, Speiser, Meighen and Dyjack, David T. (2024), Exploring Perceptions on Climate Change Through the American Climate Metrics Survey, 2016-2019, Journal of Environmental Health, Vol. 86 Issue 7, March, pp 8-17.
- 22. George, Alinda, Sharma, Pritee and Pradhan, Kalandi Charan (2024), Spatiotemporal Pattern of Vulnerability to Climate Change in Madhya Pradesh, India, Applied Spatial Analysis and Policy, Vol. 17 Issue 1, pp 55-85.
- Iacobucci, Edward and Trebilcock, Michael (2022), Existential threats: Climate change, pandemics and institutions, Canadian Public Administration, December, Vol. 65 Issue 4, pp 608-619.

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