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Select Committee on
Risk Assessment and Risk Planning

Report of Session 2021–22

Preparing for Extreme Risks: Building a Resilient Society

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The Select Committee on Risk Assessment and Risk Planning

The Select Committee on Risk Assessment and Risk Planning was appointed by the House of Lords on 15 October 2020, and re-appointed on 13 May 2021, to “consider risk assessment and risk planning in the context of disruptive national hazards”.

Membership

The Members of the Select Committee on Risk Assessment and Risk Planning were:

<u>Lord Arbuthnot of Edrom</u> (Chair)	<u>Lord Rees of Ludlow</u> OM
<u>Lord Browne of Ladyton</u>	<u>Lord Robertson of Port Ellen</u> KT
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<u>Lord O’Shaughnessy</u>	<u>Lord Willetts</u>

Declaration of interests

See Appendix 1.

A full list of Members’ interests can be found in the Register of Lords’ Interests:

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Committee staff

The staff who worked on this inquiry were Beth Hooper (Clerk), Alastair Taylor (Clerk), Sarah Jennings (Policy Analyst) and Rebecca Pickavance (Committee Operations Officer).

Contact details

All correspondence should be addressed to the Select Committee on Risk Assessment and Risk Planning, Committee Office, House of Lords, London SW1A 0PW. Telephone 020 7219 4878.

Email hlriskcmtee@parliament.uk

Twitter

You can follow the Committee on Twitter: [@LordsRiskCom](https://twitter.com/LordsRiskCom)

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Evidence is published online at <https://committees.parliament.uk/work/727/risk-assessment-and-risk-planning/publications/>

Q in footnotes refers to a question in oral evidence.

SUMMARY

Our inquiry has come at a critical time. Nearly two years have passed since the COVID-19 pandemic emerged, placing a spotlight on the Government's planning for the most serious risks facing the UK or its interests overseas. The pandemic has led to unprecedented levels of uncertainty and shock across the world with many countries struggling to respond to the virus. Prior to the onset of COVID-19, the UK's approach to risk assessment and risk management was internationally commended and viewed as rigorous. However, the pandemic has exposed the UK's risk management system as deficient and too inflexible to provide the protection our nation needs.

The risks we face are changing. Technological advances have raised the threat posed by the malicious deployment of technologies which could be used for good or ill, while traditional threats such as those from nuclear or chemical warfare remain. The risk of the failure of ageing critical infrastructure such as nuclear power stations, dams and bridges grows day on day without sufficient intervention. A reliance on electricity and the internet and the increasing complexity and interdependence of the networks underpinning daily life have left us vulnerable to cascading failures which could proliferate rapidly and cause widespread devastation. The UK's risk management system must adapt to ensure that we are prepared for the evolving extreme and systemic risks on the horizon to protect us today and into the future.

Many inquiries are seeking to document the Government's actions on COVID-19. Yet, a pandemic is only one of many risks, a fact which was clearly demonstrated to us over the course of this inquiry. It is inevitable that an inquiry of this nature would be overtaken by risks arising since the conclusion of our evidence gathering programme. Through the summer of 2021, and since, the UK has faced severe supply chain disruption and threats to the nation's fuel supply. This has raised concerns about the fragility of the just-in-time networks on which our food, fuel and essential services rely. The fall of Afghanistan to the Taliban has raised alarm about the security of the region and heightened the threat of global terrorism. Risks will continue to materialise which require action, prevention, mitigation or response. The Government must be able to identify lessons from all crises quickly and ensure it can translate them into real change. The current pandemic offers a unique opportunity to take stock of the UK's risk assessment and risk management process. We must assess and strengthen our national resilience to ensure that we are better prepared for the next crises.

Our inquiry has concluded that the UK must be better at anticipating, preparing for and responding to a range of challenging scenarios, including those which it has never experienced before. The Government's current strategy of centralised and opaque risk assessment and risk management, which fails to make adequate preparations, has left the UK vulnerable.

The UK must adopt a whole of society approach to resilience, one which emphasises the important role played by all sections of society in preparing for, adapting to and recovering from the effects of risk. Risk and resilience are not solely the concern of central Government policymakers; they have the capacity to alter the lives of millions. The Government must ensure it properly accounts

for and involves all elements of society in its risk assessment and planning. Our recommendations are aimed at ensuring this.

The COVID-19 pandemic has shown that communities can step up and help ensure national safety. The Government must see our people as an essential building block of any response and as active participants in creating resilience. They must provide them with the support and information to help them prepare for the risks they face. Volunteering represents a key opportunity to involve the public in risk management and response. The UK has a strong voluntary sector which must form the foundation of any future reservist force used in times of crisis.

Risk assessment and risk planning are a routine undertaking in the private sector. Conversations between business and industry and the Government must be held to ensure that business and industry understand what impacts they may expect to incur from the manifestation of a risk or how they may be expected to act in response. Such conversations would allow the Government to understand and learn from business and industry. Conversations of this type do occur, but currently they are ad hoc and insufficient. We urge the Government to undertake more structured and open engagement with business and industry on risk and resilience.

Our inquiry has raised significant concerns about the Government's culture and practice of risk assessment and planning. The current risk management system is veiled in an unacceptable and unnecessary level of secrecy. The UK's risk plans need to be shared widely to maximise their efficacy. Only through transparency and a healthy culture of challenge can we provide society with a reliable foundation to respond to emerging risks. While secrecy does have an important place, the UK Government defaults to secrecy too readily. This has hampered our preparedness, as society's front-line responders, including Local Resilience Forums, local government, volunteer groups and businesses and industry all struggle to access the information they need. Fear of criticism can drive an unnecessary reliance on secrecy. Our recommendations aim to bring transparency into the risk assessment process and to build better preparedness as a result.

We found that the Government's risk assessment process is unable to encompass the complexity of risks facing the UK. It fails to account for interconnected or cascading risks and chronic or long-term risks, and has a bias against low likelihood-high impact risks. As a list of risks facing the UK, it is insufficient to aid mitigation and preparedness efforts. The present approach of assessing likelihood and impact may be misleading, and lead to a false sense of confidence, particularly in terms of prioritisation of risks. The Government's risk assessment must be replaced by a more dynamic, data driven output, directly linked to preparation, mitigation and response.

No matter how sophisticated the assessment of risks, it is of little value if it is not matched by practical measures to ensure preparedness and resilience. The Government must not only anticipate risks but prepare for and respond to them effectively. Much of the Government's time and resources are focused on responding to crises and emergencies, from flooding to terrorist attacks. They must bridge the gap between analysis and operational capability to ensure the

safety and security of the population. We must place a premium on possessing the competence, capacity and skills to manage these crises. Risk plans must be frequently tested, challenged and scrutinised.

Preparation, mitigation and response plans must be scrutinised, and planners must be accountable both within Government and to Parliament, creating a system of audit which is appropriately resourced. We have proposed changes to ensure a clear governance structure and sustained, independent pressure and annual audit. Risk plans should be dynamic, resourced and every stakeholder involved should know what the mitigation process requires.

Despite the fact that prevention is significantly cheaper than response, the government has a traditional disincentive to invest against possible risks, especially low-probability high-impact risks. Spending policy for risk and resilience needs to be readdressed. Within the national security and critical national infrastructure communities there is a strong emphasis on prevention, leading to proactive resourcing. We urge the Government to ensure that spending in the civic sphere emulates this approach. Government spending should, where possible, be directed towards preparing for, preventing and mitigating disaster.

The Government will not succeed in anticipating every threat or hazard. For that reason, the country needs to be prepared to recover from shocks to which it is vulnerable. That capacity to recover must be based on a flexible, adaptable and diverse population that appreciates the need for its own resilience.

Preparing for Extreme Risks: Building a Resilient Society

CHAPTER 1: INTRODUCTION

1. The UK needs to be able to tackle unforeseeable and challenging risk scenarios. The world has changed into an increasingly complex web of interconnected systems which rely on disparate linkages across the globe. The UK must move away from a risk management strategy which prepares for individual risk scenarios in isolation and often ignores or fails to appreciate the interconnected nature of our society. No two risk scenarios will play out in the same way and many emergencies will produce cascading effects that are capable of major disruption as they rip through society. The UK's risk management system must adapt to ensure that we are prepared for the evolving extreme and systemic risks on the horizon. It must not just anticipate risks but prepare for and respond to them effectively, bridging the gap between analysis and operational capability to ensure the safety and security of the population. Much of the Government's time and attention is focused on responding to crises and emergencies, from flooding to terrorist attacks. We must place a premium on possessing the competence and capacity to manage these crises.
2. The House of Lords Risk Assessment and Risk Planning Committee was appointed during the COVID-19 pandemic. This was a momentous time in which travel ground to a halt, social interactions were transformed, and the tragic impacts of the virus were felt across the globe. The COVID-19 pandemic has illustrated the deadly potential of a novel infectious disease, with the UK death toll far surpassing the "100 fatalities" previously projected by the Government.¹ There is no evidence that the Covid-19 pandemic was an event with malicious intent. However, the technologies needed to engineer a biological weapon are "rapidly progressing"², raising the threat posed by malicious actors who may seek to emulate the chaos created by COVID-19. However, pandemics are only one of a number of extreme risks facing the UK. Severe space weather events could render smart technologies on which much of society relies inoperable for weeks or longer; this would include GPS, the internet, communications systems and power supplies. A cyber or physical attack on our critical national infrastructure could wreak havoc. We must be prepared to anticipate, plan for and respond to many extreme risks in the future.
3. Despite the manifestation of risks being highly uncertain, attempts are made to anticipate them and plan accordingly. For the last decade, the risk of a pandemic was ranked as a highest priority "tier-1" security risk.³ The UK's unpreparedness to manage the outbreak of the COVID-19 virus was and is clear. More broadly, our inquiry has analysed the UK's risk assessment process and found that our current system is deficient at assessing and

1 Cabinet Office, *National Risk Register of Civil Emergencies* (September 2017) p 34: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/644968/UK_National_Risk_Register_2017.pdf [accessed 30 November 2021]

2 Q 99 (Dr Cassidy Nelson)

3 Joint Committee on the National Security Strategy, *Biosecurity and national security* (1st Report, Session 2019–2021, HC 611, HL Paper 195)

addressing future threats and hazards. The core of the UK's current risk assessment system, the National Security Risk Assessment, is not rigorous enough to justify the confidence placed in it.

4. We consider that generalised resilience is the right response to the threat of increasingly unpredictable risk. The Government's risk management system should change from attempting to forecast and mitigate discrete risks, towards a more holistic system of preparedness. Reframing risk management through the lens of resilience would produce a risk management system that ties all sectors of society together. The UK would then be better prepared to defend against the wide range of emerging threats and hazards that confront us, with all elements of society able to mobilise and respond to events when they occur.

Our inquiry

5. On 15 October 2020, the House of Lords appointed this Committee "to consider risk assessment and risk planning in the context of disruptive national hazards".⁴ On 13 May 2021, we were re-appointed at the start of the new parliamentary session.⁵ From the outset of the inquiry, we have focused on these key questions:
 - Does the Government currently have a reliable system in place to manage the risks facing the UK?
 - Can the UK risk management system adapt and evolve to combat unpredicted, unknown and extreme risk scenarios?
 - Has the UK Government built a risk management structure that can deal with risk events that impact across multiple areas of our society?
 - How should all aspects of society be engaged within the risk assessment and risk planning system?
6. To answer these questions, and others, we engaged in an extensive evidence gathering programme. This report contains our conclusions and recommendations drafted from the evidence we have received.
7. We are grateful to all who contributed their expertise and time. On 23 December 2020 we issued a call for evidence and, in response, received 99 pieces of written evidence. Between 25 November 2020 and 23 June 2021, we took oral evidence from 85 witnesses during 29 sessions. The witnesses are listed in Appendix 2. The call for evidence is shown in Appendix 3. The evidence received is published online.
8. We focused the initial stages of the inquiry on central government. Oral evidence was taken from the Director of the Civil Contingencies Secretariat within the Cabinet Office and former Government Chief Scientific Advisers. We then identified specific risk case studies and heard evidence regarding artificial intelligence, biosecurity, infrastructure and the nuclear, oil and gas industries. Breaking away from discrete risks, we gathered evidence on mitigation strategies from business and insurance providers. Military witnesses gave evidence about the role of the armed forces during civil emergencies.

4 HL Deb, 15 October 2020, [cols 1205–1206](#) [Lords Chamber]

5 HL Deb, 13 May 2021, [cols 175–176](#) [Lords Chamber]

9. We then focused on resilience and the integration of different sectors of society within risk management. Evidence was taken from the voluntary sector, Local Resilience Forums, senior leaders and the devolved administrations.
10. Our inquiry concluded with oral evidence from the then Paymaster General, Rt. Hon. Penny Mordaunt MP, the Director of the Civil Contingencies Secretariat, and the Government Chief Scientific Adviser, Sir Patrick Vallance.
11. During the inquiry, we were granted access to the Official-Sensitive version of the National Security Risk Assessment (NSRA). Although there is no discussion of the content of the NSRA in this report, we used our access to the NSRA to validate our own conclusions and recommendations regarding the document. We held two separate, private conversations with the then Paymaster General, Penny Mordaunt MP, and the current Paymaster General, Michael Ellis MP QC, to advise the Government on potential amendments to the NSRA and aspects of the UK's risk management system.
12. The members of the Committee are listed in Appendix 1, alongside their declared interests. Throughout the inquiry, we have been grateful to have had the support of Professor David Alexander, Professor of Risk and Disaster Reduction at University College London, as special adviser to the Committee. We would also like to thank the staff team who supported our inquiry: Elizabeth Hooper, Sarah Jennings, Samantha Kenny, Rebecca Pickavance and Alastair Taylor.

Box 1: Climate Change

In its landmark 2021 report, the Intergovernmental Panel on Climate Change (IPCC) declared it “unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred”.⁶ Climate Change is one of the largest and most dominant risks facing the world, and many other risks will be exacerbated by it. The conclusions and recommendations made within this report should be considered in light of risks posed by climate change.

Each of the last four decades has been successively warmer than any decade that preceded it since 1850, with the last six years being the warmest on record globally.⁷ The level of heating to date is almost entirely caused by human emissions, with human actions heating the climate at a rate that is unprecedented in at least the last 2000 years.⁸ This heating has had a significant impact, with every additional 0.5°C of global heating leading to increases in the intensity and frequency of hot extremes, including heatwaves, heavy rains and drought. Global heating above 2.5°C would increase the risk of passing irreversible climate tipping points including Antarctic ice sheet melting, widespread forest diebacks, or a collapse of Atlantic Ocean currents.⁹ Global emissions have also risen. In 2019, atmospheric carbon dioxide concentrations were higher than at any time in at least 2 million years, and concentrations of methane and nitrous oxide were higher than at any time in at least 800,000 years.¹⁰ These changes have led to the global retreat of glaciers, surface melting of the Greenland Ice Sheet and global acidification of the ocean.¹¹

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- 6 Intergovernmental Panel on Climate Change, *Climate Change 2021, The Physical Science Basis, Summary for Policymakers* (August 2021) p 4: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf [accessed 30 November 2021]
 - 7 Climate Change Committee, *Independent Assessment of UK climate Risk* (June 2021) p 36: <https://www.theccc.org.uk/wp-content/uploads/2021/07/Independent-Assessment-of-UK-Climate-Risk-Advice-to-Govt-for-CCRA3-CCC.pdf> [accessed 30 November 2021]
 - 8 Intergovernmental Panel on Climate Change, *Climate Change 2021, The Physical Science Basis, Summary for Policymakers* (August 2021) p 6: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf [accessed 30 November 2021]
 - 9 Intergovernmental Panel on Climate Change, *Climate Change 2021, The Physical Science Basis, Summary for Policymakers* (August 2021) p 27: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf [accessed 30 November 2021]
 - 10 Intergovernmental Panel on Climate Change, *Climate Change 2021, The Physical Science Basis, Summary for Policymakers* (August 2021) p 8: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf [accessed 30 November 2021]
 - 11 Intergovernmental Panel on Climate Change, *Climate Change 2021, The Physical Science Basis, Summary for Policymakers* (August 2021) p 8: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf [accessed 30 November 2021]

The key risks and challenges

Sustained global heating would lead to an increase in the frequency, intensity and impacts of extreme weather events. Between 2000 and 2019 there were almost double the number of climate-related disasters compared to the previous 20 years, with 510,837 deaths and 3.9 billion people affected.¹² Over the same period the number of major floods has more than doubled.¹³ Warmer and drier conditions are likely to increase the risk, timing and severity of forest fires.¹⁴

Climate change could lead to irreversible shifts in regional climates. Global heating could lead to a collapse of the ocean current systems that transport warm surface waters to the North Atlantic, drastically changing weather patterns. These currents have been destabilised over the last century and may be close to a critical transition.¹⁵ This would cause shifts in monsoon patterns and lead to cooler temperatures over Northern Europe, and dryer weather and increases in winter storms across the entirety of Europe.

Global heating has caused, and will continue to cause, sea level rises through ice melting and thermal expansion from ocean warming. By 2050, UK sea levels could be 10–30 cm higher than they were in the period 1981–2000.¹⁶ In the most extreme scenarios, global sea-levels could rise two metres by 2100 and five metres by 2150.¹⁷ A two metre sea level rise would profoundly alter geography. Approximately 1.05 million square kilometres of land could be lost. A less than one metre sea level rise by 2100 could put 410 million people at risk.¹⁸ Areas that now lie just above sea level may one day become submerged. Such significant sea-rise levels could lead to coastal erosion, extreme flooding, soil contamination, the loss of infrastructure services which lie in the path of rising seas and extensive migration of displaced people.¹⁹ An increase in standing water could increase the threat of malaria carrying mosquitos and diseases associated with standing water such as Lyme's disease.²⁰

- 12 UN Office for Disaster Risk Reduction, *Human Cost of Disasters: An overview of the last 20 years 2000–2019* (October 2020) p 6: <https://reliefweb.int/sites/reliefweb.int/files/resources/Human%20Cost%20of%20Disasters%202000–2019%20Report%20-%20UN%20Office%20for%20Disaster%20Risk%20Reduction.pdf> [accessed 30 November 2021]
- 13 UN Office for Disaster Risk Reduction, *Human Cost of Disasters: An overview of the last 20 years 2000–2019* (October 2020) p 7: <https://www.undrr.org/sites/default/files/inlinefiles/Human%20Cost%20of%20Disasters%202000–2019%20FINAL.pdf> [accessed 30 November 2021]
- 14 Forest Research, 'Forest fires and climate change': <https://www.forestryresearch.gov.uk/research/climate-change-impacts/forest-fires-and-climate-change/> [accessed 22 November 2021]
- 15 Niklas Boers, 'Observation-based early-warning signals for a collapse of the Atlantic Meridional Overturning Circulation', *Nature Climate Change*, vol. 11, (2021), pp 680–688: <https://www.nature.com/articles/s41558-021-01097-4>
- 16 Climate Change Committee, *Independent Assessment of UK climate Risk* (June 2021) p 36: <https://www.theccc.org.uk/wp-content/uploads/2021/07/Independent-Assessment-of-UK-Climate-Risk-Advice-to-Govt-for-CCRA3-CCC.pdf> [accessed 30 November 2021]
- 17 Intergovernmental Panel on Climate Change, 'Climate Change 2021, *The Physical Science Basis, Summary for Policymaker*' (August 2021) p 21: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf [accessed 30 November 2021]
- 18 Nature.com, 'Global LiDAR: land elevation data reveal greatest sea-level rise vulnerability in the tropics': <https://www.nature.com/articles/s41467-021-23810-9> [accessed 22 November 2021]
- 19 National Geographic, 'Sea level rise, explained': <https://www.nationalgeographic.com/environment/article/sea-level-rise-1> [accessed 22 November 2021]
- 20 British Geological Survey, 'Impacts of climate change': <https://www.bgs.ac.uk/discovering-geology/climate-change/impacts-of-climate-change/> [accessed 22 November 2021]

Across the world, climate change could lead to widespread food insecurity,²¹ increased violent conflict, and the weakening of international law and governance.²² As areas become uninhabitable, there will be an increase in the number of Climate refugees.²³ Animal species and their habitats would be threatened by increasing temperatures, water scarcity, wildfires and flooding.²⁴ Five per cent of all species would be threatened with extinction by 2°C of warming, while 16 per cent of species could be lost if the average global temperature rise exceeds 4.3°C.²⁵

In the case of persistent high emissions, the impact on the UK would be dramatic. By 2080, temperatures of 40°C could be exceeded as often as 32°C is exceeded today.²⁶ Droughts would become more likely and severe,²⁷ while extreme heavy rainfall events would increase.²⁸ Extreme temperatures could lead to interruptions of household water supplies.²⁹ There will be increased pressure on the electricity network, while extreme climate events could lead to cascading failures across multiple infrastructure networks, with devastating impacts.³⁰ Climate hazards in the UK and abroad would cause supply chain disruptions, threatening food security in the UK.³¹

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- 21 Parliamentary Office of Science and Technology, 'Transforming the food system to deliver beneficial long-term outcomes': <https://post.parliament.uk/transforming-the-food-system/> [accessed 05 October 2021]
 - 22 UK Climate Risk Independent Assessment (CCRA3), *Technical Report Chapter 7: International Dimensions* (June 2021) p 3: <https://www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA3-Chapter-7-FINAL.pdf> [accessed 30 November 2021]
 - 23 UNCHR, 'Climate change and disaster displacement': <https://www.unhcr.org/uk/climate-change-and-disasters.html> [accessed 22 November 2021]
 - 24 UK Climate Risk Independent Assessment (CCRA3), *Technical Report Chapter 3: Natural Environment and Assets* (June 2021) p 19: <https://www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA3-Chapter-3-FINAL.pdf> [accessed 30 November 2021]
 - 25 Nature, 'Humans are driving one million species to extinction': <https://www.nature.com/articles/d41586-019-01448-4> [accessed 22 November 2021]
 - 26 Climate Change Committee, *Independent Assessment of UK climate Risk* (June 2021) p 134: <https://www.theccc.org.uk/wp-content/uploads/2021/07/Independent-Assessment-of-UK-Climate-Risk-Advice-to-Govt-for-CCRA3-CCC.pdf> [accessed 30 November 2021]
 - 27 Parliamentary Office of Science and Technology, Water supply resilience and climate change, **POST brief 40**, May 2021
 - 28 UK Climate Risk Independent Assessment (CCRA3), *Technical Report Chapter 3: Natural Environment and Assets* (June 2021) p 73: <https://www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA3-Chapter-3-FINAL.pdf> [accessed 30 November 2021]
 - 29 Climate Change Committee, *Independent Assessment of UK climate Risk* (June 2021) p 60: <https://www.theccc.org.uk/wp-content/uploads/2021/07/Independent-Assessment-of-UK-Climate-Risk-Advice-to-Govt-for-CCRA3-CCC.pdf> [accessed 30 November 2021]
 - 30 Parliamentary Office of Science and Technology, Infrastructure and climate change, **POST note 621**, March 2020
 - 31 Parliamentary Office of Science and Technology, A resilient UK food system, **POST note 626**, June 2020

Addressing the risk

The UK's Climate Change Committee have stated that adaptation action has failed to keep pace with the worsening reality of climate risk. This is despite the UK Government having the resources to address the risk.³² Limiting future climate change by reducing emissions, stabilising temperatures and preparing for climate change thorough adaptations will help reduce its consequences. The Government have acknowledged that building the UK's preparedness and resilience to climate change impacts is a cost-effective and essential way to protect our people, economy and environment.³³

Limiting temperature increases requires reductions in carbon dioxide emissions along with significant reductions in other greenhouse gas emissions. The frequency and intensity of extreme weather will continue to increase until this is done. Although some changes already caused by global heating, such as sea level rises, are irreversible, the International Panel on Climate Change advised that "strong and sustained reductions in emissions of CO₂ and other greenhouse gases would limit climate change."³⁴ At the COP26 conference in Glasgow, countries agreed to meet next year to pledge further cuts to emissions of CO₂, with an aim of limiting temperature rises to 1.5°C.³⁵

Adaptation is also needed to reduce damage from climate change that has already occurred or is projected to occur. This includes improving building design, retrofitting existing buildings, greater flood defence investment, increasing plant diversity, restoring peatlands, urban greening and adapting agricultural practices.³⁶

In October 2021 the Government published its Net Zero Strategy which set out how the UK would halve emissions by 2030 and reach net zero emissions by 2050. The Climate Change Committee welcomed the plan as "an ambitious and comprehensive strategy that marks a significant step forward for UK climate policy".³⁷ However, they also noted that "There are some strategic gaps, as well as uncertainties over how the Government's ambitions will be delivered in some sectors".³⁸

Lessons to be learned from the climate change case study

13. **Many of the risks facing the UK are likely to increase both in magnitude and frequency as a result of climate change, and risk assessment cannot be conducted without acknowledging this fact.**

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- 32 Climate Change Committee, 'Independent Assessment of UK Climate Risk': <https://www.theccc.org.uk/publication/independent-assessment-of-uk-climate-risk/> [accessed 22 November 2021]
 - 33 Department for Environment, Food and Rural Affairs, 'Climate change adaptation: policy information': <https://www.gov.uk/government/publications/climate-change-adaptation-policy-information/climate-change-adaptation-policy-information> [accessed 22 November 2021]
 - 34 Intergovernmental Panel on Climate Change, 'Climate change widespread, rapid, and intensifying—IPCC': <https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/> [accessed 22 November 2021]
 - 35 'COP26: What was agreed at the Glasgow climate conference?', *BBC News* (16 November 2021): <https://www.bbc.co.uk/news/science-environment-56901261> [accessed 22 November 2021]
 - 36 Climate Change Committee, *Independent Assessment of UK climate Risk* (June 2021) p 27: <https://www.theccc.org.uk/wp-content/uploads/2021/07/Independent-Assessment-of-UK-Climate-Risk-Advice-to-Govt-for-CCRA3-CCC.pdf> [accessed 30 November 2021]
 - 37 Climate Change Committee, 'Independent Assessment: The UK's Net Zero Strategy': <https://www.theccc.org.uk/publication/independent-assessment-the-uks-net-zero-strategy/> [accessed 22 November 2021]
 - 38 Climate Change Committee, 'Government's Net Zero Strategy is a major step forward, CCC says': <https://www.theccc.org.uk/2021/10/26/governments-net-zero-strategy-is-a-major-step-forward-ccc-says/> [accessed 22 November 2021]

Climate change is an ever more significant risk facing the UK and action to address it needs to be undertaken rapidly and as a priority.

Defining extreme risk

14. There is no single accepted definition of extreme risk. It is agreed that extreme risks have systemic, widespread, effects,³⁹ can impact across international borders and could cascade through many of the sectors of society.⁴⁰ Through their extensive impacts, extreme risks can erode a state's ability to meet its strategic objectives.⁴¹
15. Definitions of extreme risks are not confined to sudden shock events. They also include evolving chronic risks. These risks have the potential to cause irreversible changes to the global system. These changes are likely to build slowly over time. Examples of such risks include increasing antimicrobial resistance and events associated with anthropogenic climate change such as ice sheet collapse, largescale permafrost melting and forest dieback.⁴²
16. In this report, we will define extreme risk as:

‘High-impact events that, if they materialise, would cause widespread damage to many aspects of our society and compromise the achievement of the strategic objectives set by the Government. They can impact at global, national or regional levels and could cause significant loss of life, loss of value, or a substantial and detrimental societal impact.’
17. A distinction can be drawn between threats and hazards. The 2008 National Risk Register refers to hazards as being natural events without malicious intent, while threats have malicious intent.⁴³

Why investigate now?

18. The Committee was formed amid the global upheaval of the COVID-19 pandemic. Whilst the Committee never intended to undertake a COVID-19 inquiry, the pandemic has taught us daily lessons about the need for better resilience. The whole of society currently is engaged in a fight against the virus. It shows that people, when properly informed, will respond appropriately—pessimism about our behaviour in the early stages of the epidemic was misplaced. We need to adopt a whole of society approach to resilience, learning not only from our experiences in the UK but also from examples of best practice internationally.

39 [Q 235](#) (Lord Harris of Haringey, Professor Brian Collins)

40 Written evidence from Warwick Manufacturing Group ([RSK0059](#))

41 Suzanne Raine, ‘Half of the National Risk Register is Missing’, Royal United Services Institute, vol. 41, (2021), pp 1–3: https://nationalpreparednesscommission.uk/wp-content/uploads/2021/01/raine_web_newsbrief_0.pdf

42 Written evidence from The Adaptation Committee of the Committee on Climate Change ([RSK0065](#))

43 Cabinet Office, *National Risk Register* (2008) p 3: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/969213/20210310_2008-NRR-Title-Page_UPDATED-merged-1-2.pdf [accessed 30 November 2021]

CHAPTER 2: THE UK RISK LANDSCAPE

19. This chapter outlines the central pillars of the UK's risk management framework. It will start with a description of the National Security Risk Assessment (NSRA) and National Risk Register (NRR) before detailing the UK's risk governance structure and will finish with an overview of the most recent policy developments within UK risk management.

Risk management in the UK

The National Security Risk Assessment

20. The Government identifies and assesses risks through the process of creating the NSRA and its public facing version, the NRR. The NSRA is an assessment of the most serious malicious and non-malicious, chronic and acute, international and domestic threats and hazards facing the UK and its interests overseas.⁴⁴ The creation of the document is overseen by the Civil Contingencies Secretariat (CCS) within the Cabinet Office, and it is undertaken every two years.⁴⁵
21. There are approximately 130 risks identified in the 2019 NSRA. The risks are listed with two different classifications (Official-Sensitive and Secret). Each risk is presented in a Reasonable Worst-Case Scenario (RWCS). The RWCS is explained in paragraph 26. Each risk is assigned an impact and likelihood score, a position on a risk and likelihood matrix, a response capability and recovery requirement, and a description of the uncertainty involved in making the assessment. Each risk is then assigned to a Lead Government Department which will assume responsibility for mitigating and planning for it.
22. In order to understand the probability of a risk manifesting, likelihood scores on a scale of one to five are assigned to each risk. A one-point increase is equal to a tenfold increase in the likelihood of occurrence. Risks are included within the NSRA on the basis of their likelihood of occurring in the next two years. Likelihood assessments are estimated according to both qualitative and quantitative data, if available, including historical data analysis and numerical modelling.⁴⁶
23. To assess how damaging a risk would be if it occurred, an impact score on a scale of one and five is assigned to the RWCS for each risk. A one-point increase in the score represents a ten-fold increase in impact. The impact is assessed across multiple dimensions including human welfare, economic damage, disruption to essential services, environmental damage, behavioural impacts, impacts on security and impact on international relations.⁴⁷
24. Departments are responsible for horizon scanning of the risk landscape within their policy portfolio (e.g., environmental risks for the Department for Environment, Food and Rural Affairs). After this scanning process the departments then define a RWCS for each risk identified. These scenarios are

44 Q 1 (Roger Hargreaves)

45 Cabinet Office, *National Risk Register* (December 2020) p 5: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/952959/6.6920_CO_CCS_s_National_Risk_Register_2020_11-1-21-FINAL.pdf [accessed 30 November 2021]

46 Private correspondence with the Cabinet Office

47 Cabinet Office, *National Risk Register* (December 2020) p 12: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/952959/6.6920_CO_CCS_s_National_Risk_Register_2020_11-1-21-FINAL.pdf [accessed 30 November 2021]

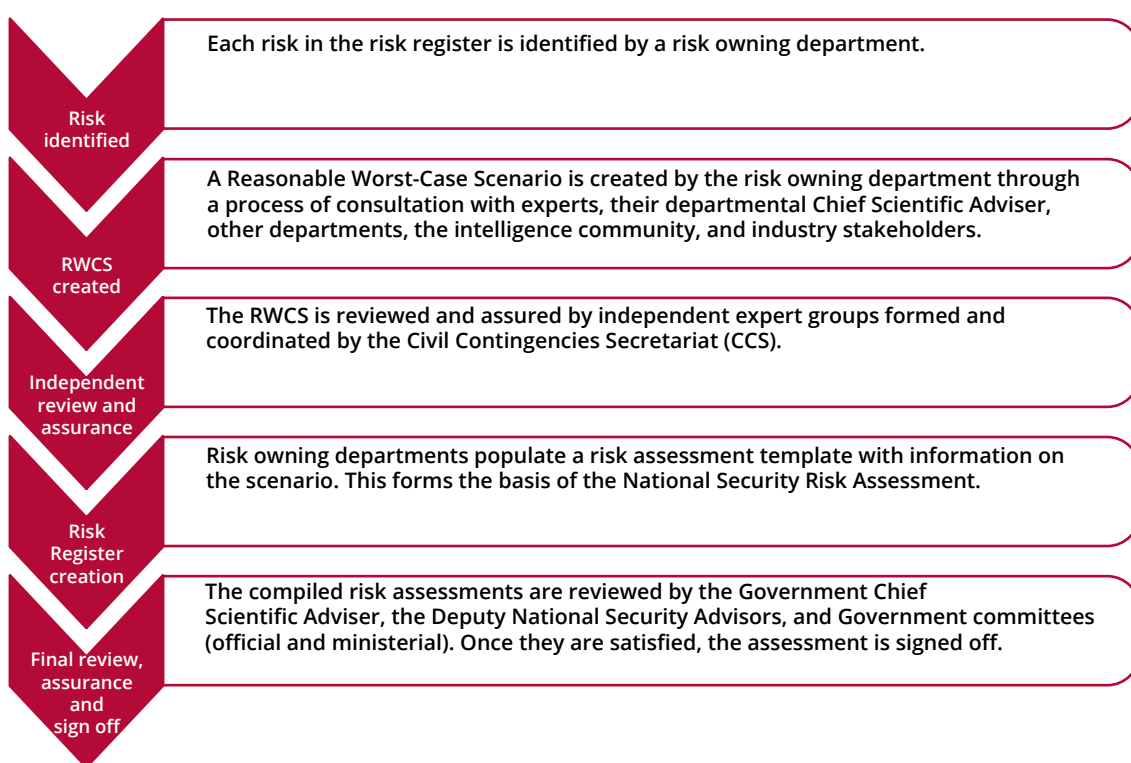
then analysed by the CCS. Once the scenarios have been through a challenge process, they are passed back to departments to populate risk assessment templates. These are then reviewed by departmental Chief Scientific Advisers. To complete the process, all the risk templates are collected for a review by the Government Chief Scientific Adviser, the Deputy Chief Scientific Advisers and relevant committees (including ministers) for sign-off.⁴⁸

25. The CCS is responsible for helping government departments to prepare for and respond to risks held in the NSRA. The CCS plays a “refereeing role” to ensure that departments are engaging with risk management within their portfolios.⁴⁹

Reasonable Worst-Case Scenario

26. After risks have been identified through a process of horizon-scanning, risk owners (individual government departments) are responsible for creating the RWCS. The RWCS is a subjective judgement of a risk scenario chosen somewhere between the worst thing that could possibly happen and the most likely outcome to occur.⁵⁰ As a subjective judgement it incorporates a high level of uncertainty. It is a planning tool and not a prediction of likely outcomes.

Figure 1 Reasonable Worst-Case Scenario Construction



Source: Private correspondence with the Cabinet Office

48 [Q 286](#) (Sir Patrick Vallance)

49 [Q 7](#) (Roger Hargreaves)

50 Oral evidence taken before the Joint Committee on the National Security Strategy, inquiry on Biosecurity and national security, 19 October 2020 (Session 2019–21), [Q 35](#) (Sir Patrick Vallance)

Lead Government Departments (LGDs)

27. Within risk management, the Government employs a Lead Government Department (LGD) principle. In this system, each government department is individually responsible for risks allocated to them within the NSRA. This principle requires the department, with the support of other Government departments and the Cabinet Office, to lead on preparation for a given risk.
28. The Secretary of State for each department is responsible for preparedness against the risks assigned to that department. Secretaries of State must, with the support of officials, create plans which respond to, mitigate or prevent a given risk. The CCS does not have the power to formally audit departmental preparedness or to interrogate departmental risk plans. Secretaries of State are held accountable for their risk plans by the Cabinet Office and, arguably, the Prime Minister.⁵¹

National Risk Register

29. The National Risk Register (NRR) is the public facing version of the NSRA. One of its objectives is to communicate risk information to a wide range of groups including the public, businesses, associations, charities and civil society organisations. The NRR provides an overview of the major risks that the UK faces. It identifies the types of emergencies that could occur because of these risks and the mitigation practices the government are employing against them. It also advises how individuals, families and businesses should prepare for the risks identified in the register.⁵² The NRR is produced every two-years after the completion of the NSRA. The latest version was published on 18 December 2020.

Local governance of risk management

30. Management of the risks identified in the NSRA is coordinated at a national level by Lead Government Departments and at a local level by Local Resilience Forums (LRFs). LRFs are multi-agency partnerships made up of representatives from local public services, including the emergency services, local authorities, the NHS and arms-length statutory bodies such as the Environment Agency.⁵³
31. Emergency responders are separated into Category 1 and Category 2 organisations, defined by the Civil Contingencies Act 2004. Those in Category 1 are organisations at the core of the response to most emergencies, including the emergency services, local authorities, NHS bodies. They are required to perform several tasks including:
 - Assessing the risk of emergencies occurring and using this to inform contingency planning;
 - Putting in place emergency plans;

51 *Q 4* (Roger Hargreaves)

52 Cabinet Office, *National Risk Register* (December 2020) p 5: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/952959/6.6920_CO_CCS_s_National_Risk_Register_2020_11-1-21-FINAL.pdf [accessed 30 November 2021]

53 Cabinet Office, *The role of Local Resilience Forums* (July 2013), para 34: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/62277/The_role_of_Local_Resilience_Forum- A_reference_document_v2_July_2013.pdf [accessed 30 November 2021]

- Putting in place arrangements to make information available to the public about civil protection matters and maintaining arrangements to warn, inform and advise the public in the event of an emergency; and,
 - Sharing information and cooperating with other local responders.⁵⁴
32. Category 2 organisations, including the Health and Safety Executive, transport and utility companies, are ‘co-operating bodies’. They are less involved in planning but will be heavily involved in incidents that affect their own sector. Category 2 responders have a lesser set of duties such as co-operating and sharing relevant information with other Category 1 and 2 responders.⁵⁵
33. LRFs are a forum through which local responders discharge their duties to assess and plan for risks. To do so, LRFs are provided with hard copies of the ‘Official-Sensitive’ version of the NSRA. From this, LRFs develop their own localised risk assessments and resilience plans. LRFs are primarily supported by regional advisors from the Department for Levelling Up, Housing and Communities (formerly the Ministry of Housing, Communities and Local Government).⁵⁶ These regional advisors are the contact point between national and local bodies, particularly during a crisis. The CCS supports the work of LRFs through the creation of guidance on risk management and by conducting nation-wide roadshows where the findings of the NSRA are presented.⁵⁷ Local level risk accountability is built into the system through activities conducted by the Department for Levelling Up, Housing and Communities and the CCS’s testing programme. That takes place within the Resilience Capabilities Programme and the training provided by the Emergency Planning College.⁵⁸

Civil Contingencies Act 2004

34. The purpose of the Civil Contingencies Act 2004 is to deliver a single statutory framework for civil protection in the UK. The Act is separated into two parts: local arrangements for civil protection (Part 1) and emergency powers (Part 2).⁵⁹
35. Part 1 establishes a set of roles and responsibilities for those involved in emergency preparation and response at the local level. Part 2 of the Act updated the 1920 Emergency Powers Act. It allows for the making of temporary special legislation (emergency regulations) to help deal with the most serious of emergencies.⁶⁰

54 Cabinet Office, ‘Preparation and planning for emergencies: responsibilities of responder agencies and others’ : <https://www.gov.uk/guidance/preparation-and-planning-for-emergencies-responsibilities-of-responder-agencies-and-others> [accessed 22 November 2021]

55 Civil Contingencies Act 2004, [Schedule 1](#)

56 [Q 224](#) (John Barradell)

57 [Q 12](#) (Roger Hargreaves)

58 Cabinet Office, ‘Preparation and planning for emergencies: responsibilities of responder agencies and others’: <https://www.gov.uk/guidance/preparation-and-planning-for-emergencies-responsibilities-of-responder-agencies-and-others> [accessed 22 November 2021]

59 Cabinet Office, ‘Preparation and planning for emergencies: responsibilities of responder agencies and others’: <https://www.gov.uk/guidance/preparation-and-planning-for-emergencies-responsibilities-of-responder-agencies-and-others> [accessed 22 November 2021]

60 Civil Contingencies Act 2004, [Introductory](#)

36. During the COVID-19 Pandemic, the Government chose not to use the CCA as the legislative framework for their response. Instead, the Government used the Public Health Act 1984 and passed the Coronavirus Act 2020.

Recent policy developments

Integrated Review

37. The Government set out the UK's national security and international policy ambitions in a review of foreign, defence security and international development policies entitled: 'Global Britain in a Competitive Age: The Integrated Review of Security, Defence, Development and Foreign Policy' (the IR). The IR was published in March 2021. One of the Government's four overarching objectives with the IR is "building resilience at home and overseas."⁶¹ The IR set out a total of five key priority actions relating to risk assessment and risk planning:
- To establish a "whole-of-society" approach to resilience, so that individuals, business and organisations are central to building resilience in the UK.
 - To consider the diverse array of threats and hazards threatening the UK and respond to them through the integration of national security with economic, health and environmental policy. The IR also advocated the connection of domestic and international government policy to tackle risks at source.
 - To develop more capabilities—people, skills, and equipment—that can be used in a range of risk scenarios.
 - A review of the methodology of the NSRA.
 - To strengthen the UK's analytical, policy and operational tools to better understand cross-cutting, complex risks.
38. We welcome the publication of the IR, but as this report will propose, significant additional action will be essential to achieve the objectives it seeks.

UK Health Security Agency

39. In Spring 2021, the Government announced the creation of the UK Health Security Agency (UKHSA), with responsibility for planning, preventing and responding to external health threats, and providing intellectual, scientific and operational leadership at the international, national and local level.⁶²
40. The UKHSA will be the UK's permanent standing capacity for mitigating health-related threats. The Government plan to do this through expert

61 Cabinet Office, 'Global Britain in a Competitive Age: the Integrated Review of Security, Defence, Development and Foreign Policy': <https://www.gov.uk/government/publications/global-britain-in-a-competitive-age-the-integrated-review-of-security-defence-development-and-foreign-policy/global-britain-in-a-competitive-age-the-integrated-review-of-security-defence-development-and-foreign-policy> [accessed 22 November 2021]

62 Department of Health and Social Care, 'New UK Health Security Agency to lead response to future health threats': <https://www.gov.uk/government/news/new-uk-health-security-agency-to-lead-response-to-future-health-threats> [accessed 22 November 2021]

consultation with public health service experts, data analytics and genomic surveillance, and testing and contact tracing capability.⁶³

Office for Science and Technology Strategy

41. In June 2021, the Prime Minister announced the creation of the National Science and Technology Council and the Office for Science and Technology Strategy. The ministerial council, chaired by the Prime Minister, will seek to set the strategic direction for scientific and technological advantage in the UK.⁶⁴ The Office for Science and Technology Strategy will support the work of the ministerial council. It will sit within the Cabinet Office and will be led by the Government Chief Scientific Adviser (GCSA). In addition to acting as head of the Office for Science and Technology Strategy, the GCSA will also act as the inaugural National Technology Adviser.
42. The Office for Science and Technology Strategy will provide an insights function that will give the Government information on emerging technology, horizon scanning and capability assessments.⁶⁵ Currently there are no plans for this insights function to inform the NSRA.⁶⁶

The Climate Change Committee

43. The Climate Change Committee (CCC) is an independent, statutory body established under the Climate Change Act 2008. The CCC advises the UK Government and devolved administrations on emissions targets and reports to the UK Parliament on adaptation to the impacts of climate change.⁶⁷
44. In 2021, the Adaptation Sub-Committee of the CCC produced an independent assessment of UK climate risk. The assessment found that the UK's adaptation action has failed to keep pace with the worsening risk of climate change and that while the UK has the capacity and resources to respond effectively to these risks it has not done so.⁶⁸

Biological Security Strategy

45. Published in 2018, the UK's Biological Security Strategy attempted to coordinate a cross-governmental approach to biological risks, whether they materialised naturally, accidentally or deliberately. The Strategy identified four main biological risks to the UK: a major health crisis; antimicrobial resistance, a deliberate biological attack by state or non-state actors; and animal and plant diseases.
46. The strategy describes how much of the governance fell within existing departmental portfolios and governance mechanisms. Commitments

63 Department of Health and Social Care, 'Letter from Lord Bethell to Dr Jenny Harries, UKHSA Chief Executive': <https://www.gov.uk/government/publications/ukhsa-priorities-in-2021-to-2022/letter-from-lord-bethell-to-dr-jenny-harries-ukhsa-chief-executive> [accessed 22 November 2021]

64 Prime Minister's Office, 'Prime Minister sets out plans to realise and maximise the opportunities of scientific and technological breakthroughs': <https://www.gov.uk/government/news/prime-minister-sets-out-plans-to-realise-and-maximise-the-opportunities-of-scientific-and-technological-breakthroughs> [accessed 22 November 2021]

65 Q 284 (Sir Patrick Vallance)

66 Q 284 (Sir Patrick Vallance)

67 Climate Change Committee, 'About the Climate Change Committee': <https://www.theccc.org.uk/> [accessed 22 November 2021]

68 Climate Change Committee, *Independent Assessment of UK climate Risk* (June 2021) p 87: <https://www.theccc.org.uk/wp-content/uploads/2021/07/Independent-Assessment-of-UK-Climate-Risk-Advice-to-Govt-for-CCRA3-CCC.pdf> [accessed 30 November 2021]

which required cross-Government working were to be owned by a cross-Government director-level governance board. This board was to report to the Threats, Hazards, Resilience and Contingencies Subcommittee of the National Security Council, through the Security Minister. The GCSA would maintain an oversight role. However, the Threats, Hazards, Resilience and Contingencies Subcommittee was disbanded in July 2019.⁶⁹ A report by the Joint Committee on the National Security Strategy on ‘Biosecurity and national security’ concluded that there is “a striking absence of strategic leadership of the UK’s biological security work as a whole”.⁷⁰

69 Written Answer [UIN 59366](#), Session 2019–2021

70 Joint Committee on the National Security Strategy, *Biosecurity and national security* (1st Report, Session 2019–2021, HC 611, HL Paper 195), page 55

CHAPTER 3: RESILIENCE

47. For over a decade a pandemic had been identified as one of the most significant risks facing the UK.⁷¹ According to Roger Hargreaves, Director of the Civil Contingencies Secretariat (CCS), before the onset of COVID-19 the UK's approach to risk assessment and risk management was viewed as a model of best practice around the world.⁷² Yet the COVID-19 pandemic caught the UK unprepared, raising fundamental questions about the robustness of this alleged "gold standard" approach.⁷³
48. We now have a unique opportunity to re-assess the UK's approach to risk management, learning lessons from COVID-19 as well as from other extreme events the UK has faced. We have a particular chance to reconsider the importance of resilience. Dr Simon Harwood, Director of Defence and Security at Cranfield University, noted that "Covid-19 has exposed everything that is brittle about making efficiency the priority for both the public and private sectors".⁷⁴ This chapter focuses on the Government's approach to risk and resilience, including the governance, policy and culture changes now required to build UK resilience.

What is resilience?

49. There are many definitions of resilience. Our witnesses noted the following common characteristics of resilience or resilient systems:
- The ability to absorb disturbance, shocks and stresses by adapting to their occurrence;
 - The ability to 'bounce back' from those disturbances;
 - The ability to learn from failures or 'bounce forward'; and,
 - The ability to achieve the above regardless of what disturbance, shock or stress one is exposed to.⁷⁵

Witnesses also noted that resilience is not just a physical or material characteristic, it also refers to emotional and psychological resilience.⁷⁶ Professor Tim Watson, Director of the Cyber Security Centre, Warwick Manufacturing Group at the University of Warwick, said that these disturbances, shocks and stresses are not just sudden events, but can build up slowly over time. A resilient system may be changed by the disturbance, and may appear different in the aftermath, but it will have the capacity to continue performing its intended purpose and achieve its strategic objectives.⁷⁷

50. For the purposes of this report, we will use the United Nations Office for Disaster Risk Reduction (UNDRR) definition of resilience (Box 2), noting that resilience refers to emotional and psychological resilience as well as physical or material resilience.

71 Joint Committee on the National Security Strategy, *Biosecurity and national security* (First report, Session 2019–2021, HC 611, HL 195)

72 [Q 2](#) (Roger Hargreaves)

73 [Q 2](#) (Roger Hargreaves)

74 [Q 88](#) (Dr Simon Harwood)

75 [Q 155](#) (Professor Tim Watson); [Q 155](#) (Professor Jim Hall); Written evidence from Dr Kristen MacAskill ([RSK0046](#))

76 [Q 155](#) (Professor Tim Watson); [Q 127](#) (Lord Houghton of Richmond)

77 [Q 155](#) (Professor Tim Watson)

Box 2: United Nations Office for Disaster Risk Reduction (UNDRR) definition of resilience

The United Nations Office for Disaster Risk Reduction (UNDRR) defines resilience as: “The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management.” This applies to both hazards and threats.

Source: UNDRR, ‘Resilience’: <https://www.undrr.org/terminology/resilience> [accessed 30 November 2021]

Why resilience?

51. For many of our witnesses, an enhanced focus on resilience offers a means to combat the risk posed by an increasingly interconnected world which emphasises the value of efficiency, aims to eliminate redundancy and relies on ‘just in time’ delivery models. Resilience First, a business membership organisation promoting enhanced resilience in the private sector, argued for greater investment in ‘just in case’ rather than ‘just in time’ resources, saying that: “By shaving ever more from a system in the search for efficiency then there is a point when it becomes prone to failure.”⁷⁸ Professor Sir Mark Walport, former Government Chief Scientific Adviser, said: “As societies have become more efficient, arguably they have become less resilient.”⁷⁹ Increased resilience involves a rebalancing of the efficiencies and redundancies of modern society to ensure systems can respond to shocks.
52. A focus on resilience to risks also corresponds with a move away from a system which prepares for individual risks. A resilient system is one which can flexibly respond to a wide range of shocks, reducing the danger of being caught unawares by an unexpected event. The Resilience Shift, an organisation promoting global resilience, recommended to us the use of an ‘all hazards’ or hazard-agnostic approach, suggesting: “More thought is needed on actions and interventions within the system that will enhance its resilience to ‘all hazards’”.⁸⁰ Indeed, Professor Watson noted that focusing too much on specific hazards can be detrimental to resilience, saying: “Specified resilience, listing the bad things, is a really good thing to do, but it is not the only thing you should do; you should also focus on general resilience. Often, when we focus on optimising for those specified bad things, we damage general resilience.”⁸¹ Sir Oliver Letwin, former Chancellor of the Duchy of Lancaster, noted that the UK is poor at responding to unexpected shocks:

“We, in particular, are weakest in knowing how to deal with circumstances that arise despite our best efforts, and in having flexible responses that do not depend on having guessed what will happen and

78 Written evidence from Resilience First ([RSK0015](#))

79 [Q 32](#) (Professor Sir Mark Walport)

80 Written evidence from the Resilience Shift ([RSK0064](#))

81 [Q 155](#) (Professor Tim Watson)

why it will happen but that are capable of adapting themselves rapidly and effectively to the circumstances that we meet.”³⁸²⁸³⁸⁴

A resilience led approach to risk management involves a broader appraisal of the health and security of our society and offers an opportunity to identify and resolve weak points which are prone to failure.

The National Resilience Strategy

53. In the Integrated Review the Government has committed to developing “a comprehensive national resilience strategy, in partnership with the devolved administrations and English regions, local government, the private sector and the public.”⁸⁵ The National Resilience Strategy call for evidence states that the strategy will focus on: “the UK’s ability to anticipate, assess, prevent, mitigate, respond to, and recover from known, unknown, direct, indirect and emerging risks.”⁸⁶ It sets out a series of core principles to help achieve the stated vision of making the UK “the most resilient nation”. These are:
 - “We should understand the risks we face, including the impacts they could have, and our exposure to them.
 - We should invest in preparation to better prevent, mitigate and recover from risks.
 - We should energise and empower everyone who can make a contribution.”⁸⁷
54. We welcome the Government’s commitment to focusing on resilience, particularly noting the role played by all sectors of society. As discussed throughout this report, the UK Government has failed to take a whole of society approach to resilience. Resilience is a long-term goal, and the effort to build resilience should not cease if and when the UK achieves the proposed vision. The severity of some risks is increasing year on year, making resilience an ever-shifting goal. As Professor Jim Hall, Professor of Climate and Environmental Risks at the University of Oxford, warned, “Resilience is an issue that never goes away, but it is easy to forget about when you are not in the middle of an emergency.”⁸⁸ The proposed National Resilience Strategy will set out a vision for UK resilience in 2030, but we welcome

82 Home Office, Department for Health and Social Care and Department for Environment, Food and Rural Affairs, *Biological Security Strategy* (July 2018) p 37: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/730213/2018_UK_Biological_Security_Strategy.pdf [accessed 30 November 2021]

83 Home Office, Department for Health and Social Care and Department for Environment, Food and Rural Affairs, *Biological Security Strategy* (July 2018): https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/730213/2018_UK_Biological_Security_Strategy.pdf [accessed 30 November 2021]

84 [Q 250](#) (Sir Oliver Letwin)

85 Cabinet Office, *Global Britain in a Competitive Age: the Integrated Review of Security, Defence, Development and Foreign Policy*, CP 403 (March 2021), p 88: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/975077/Global_Britain_in_a_Competitive_Age_the_Integrated_Review_of_Security_Defence_Development_and_Foreign_Policy.pdf [accessed 30 November 2021]

86 Cabinet Office, *The National Resilience Strategy: A Call for Evidence* (July 2021), p 12: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1001404/Resilience_Strategy_-_Call_for_Evidence.pdf [accessed 30 November 2021]

87 Cabinet Office, *The National Resilience Strategy: A Call for Evidence* (July 2021), p 7: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1001404/Resilience_Strategy_-_Call_for_Evidence.pdf [accessed 30 November 2021]

88 [Q 160](#) (Professor Jim Hall)

the acknowledgement by the Government that “the endeavour of improving national resilience will stretch far beyond this timeframe”.⁸⁹

Box 3: Severe Space Weather

Space weather, which cannot accurately be predicted or fully mitigated, represents a risk against which resilience offers the best defence. Space weather is caused by the ejection of radiation and particles from the sun during a solar storm which, when it interacts with Earth’s magnetic field and upper atmosphere, can cause radio signal interference, damage to electronics, power outages and satellite disruption.⁹⁰ Solar particles interact with the Earth’s magnetic field to produce powerful electromagnetic fluctuations that can create large electrical currents in grounded conductors such as electricity networks, pipelines and railway tracks.⁹¹ The most serious impacts of a severe solar storm are likely to come from coronal mass ejections (CMEs)—explosive eruptions on the Sun that can lead to powerful geomagnetic storms when they hit the earth.⁹²

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- 89 Cabinet Office, *The National Resilience Strategy: A Call for Evidence* (July 2021), p 14: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1001404/Resilience_Strategy_-_Call_for_Evidence.pdf [accessed 30 November 2021]
- 90 Parliamentary Office of Science and Technology, Space weather, *POSTnote 361*, July 2012
- 91 Royal Academy of Engineering, *Extreme space weather: impacts on engineered systems and infrastructure* (February 2013) p 11: <https://www.raeng.org.uk/publications/reports/space-weather-full-report> [accessed 30 November 2021]
- 92 Cabinet Office, *Space Weather Preparedness Strategy* (July 2015) p 7: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/449593/BIS-15-457-space-weather-preparedness-strategy.pdf [accessed 30 November 2021]

The impact of a severe solar storm could be enormous. The UK's national electricity grid could come under immense strain and blackouts could occur. Grid transformers across the UK could be damaged and taken out of service and the time to repair could be between weeks and months.⁹³ Temporary outages or the interruption of satellites,⁹⁴ and the inability of satellite signals to reach the Earth could throw communication and navigation systems into chaos.⁹⁵ Global navigation satellite systems such as GPS could be completely inoperable for a time.⁹⁶ The emergency communications system used by the emergency service in the UK is dependent on GPS and could be taken offline.⁹⁷ Critical infrastructures could be disrupted by the power and communications failures, putting lives at risk. Road traffic management systems, streetlights and rail signalling systems could fail and navigation systems could begin guiding maritime, aircraft and road traffic into dangerous locations. Aircraft systems failures could lead to widespread aviation disruption.⁹⁸ and passengers and crew involved in commercial aviation could be exposed to doses of radiation three times the radiation dose received from a CT scan.⁹⁹

The northern lights could light up the skies, with the light bright enough to read by.¹⁰⁰ Public behaviour in response to the event would be unpredictable. Social order could be threatened, with widespread public disorder and panic buying. Conspiracy theories could proliferate on social media, exacerbated by the lack of public knowledge on space weather. Stockpiling of resources by the population could lead to the breakdown of supply chains.¹⁰¹ Infrastructure failure and a breakdown of social cohesion could lead to impacts of an unpredictable direction and unknowable magnitude.

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- 93 Royal Academy of Engineering, *Extreme space weather: impacts on engineered systems and infrastructure* (February 2013) p 4: <https://www.raeng.org.uk/publications/reports/space-weather-full-report> [accessed 30 November 2021]
- 94 Royal Academy of Engineering, *Extreme space weather: impacts on engineered systems and infrastructure* (February 2013) p 5: <https://www.raeng.org.uk/publications/reports/space-weather-full-report> [accessed 30 November 2021]
- 95 Cabinet Office, *National Risk Register* (December 2020) p 34: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/952959/6.6920_CO_CCS_s_National_Risk_Register_2020_11-1-21-FINAL.pdf [accessed 30 November 2021]
- 96 Royal Academy of Engineering, *Extreme space weather: impacts on engineered systems and infrastructure* (February 2013) p 5: <https://www.raeng.org.uk/publications/reports/space-weather-full-report> [accessed 30 November 2021]
- 97 Royal Academy of Engineering, *Extreme space weather: impacts on engineered systems and infrastructure* (February 2013) p 5: <https://www.raeng.org.uk/publications/reports/space-weather-full-report> [accessed 30 November 2021]
- 98 Written evidence from Space Environment Impacts Expert Group (SEIEG) ([RSK0056](#))
- 99 Royal Academy of Engineering, *Extreme space weather: impacts on engineered systems and infrastructure* (February 2013) p 5: <https://www.raeng.org.uk/publications/reports/space-weather-full-report> [accessed 30 November 2021]
- 100 National Geographic, 'What If the Biggest Solar Storm on Record Happened Today?': <https://www.nationalgeographic.com/science/article/110302-solar-flares-sun-storms-earth-danger-carrington-event-science> [accessed 23 September 2021]
- 101 Science and Technology Facilities Council, *Summary of space weather worst-case environments (2nd revised edition)* (July 2020) p 42: <https://epubs.stfc.ac.uk/manifestation/46642578/RAL-TR-2020-005.pdf> [accessed 30 November 2021]

A severe solar storm would occur almost without warning. The UK would likely only have 12 hours' notice from observation to impact. The polarity of the storm determines whether it will impact the Earth severely or in a more limited manner. The UK will only know this information 15-30 minutes before the storm arrives.¹⁰² These short timescales make mitigation difficult. A severe solar storm could last many days, up to two weeks.¹⁰³

A severe solar storm has not hit the earth in living memory. The Carrington Event in 1859 was the largest space weather event to take place since modern records began. No truly extreme storm on a similar scale to the Carrington Event has occurred since the start of the space age, but there have been a number of 'near misses' which have caused major damage and disruption.¹⁰⁴

The world is increasingly reliant on electricity and satellite communications for its routine operation. Emerging technologies such as autonomous navigation systems in cars, planes and ships; 5G mobile communications; and the Internet of Things could increase our vulnerability to space weather.¹⁰⁵

Given the short warning times and high impact associated with extreme weather, mitigation is challenging. Collaboration with experts such as scientists, behavioural psychologists and engineers could help to develop mitigation plans which address the cascading impacts that a solar weather event would have on society. Continued close collaboration with the National Grid could help to improve the grid systems resilience and minimise vulnerabilities.¹⁰⁶ In September 2021 the Government published its 'UK Severe Space Weather Preparedness Strategy' which makes commitments to: enhance our understanding of severe space weather, its impacts, and our ability to forecast events; increase the resilience of essential infrastructure and services and minimise the impacts of severe space weather; and ensure the UK can respond to events effectively and recover from them quickly.¹⁰⁷ Our report makes recommendations about integrating the public into the UK's resilience structure, implementation of which could help limit the impact of a solar weather event (paragraphs 185, 186 and 187).

Central government approach to risk

55. While resilience is a society wide endeavour, it is the role of the Government to set the direction and example for the whole of the UK. The rest of this chapter will focus on the changes needed within Government to help build resilience.

102 Cabinet Office, *Space Weather Preparedness Strategy* (July 2015) p 11: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/449593/BIS-15-457-space-weather-preparedness-strategy.pdf [accessed 30 November 2021]

103 Science and Technology Facilities Council, *Summary of space weather worst-case environments (2nd revised edition)* (July 2020) p 1: <https://epubs.stfc.ac.uk/manifestation/46642578/RAL-TR-2020-005.pdf> [accessed 30 November 2021]

104 Cabinet Office, *Space Weather Preparedness Strategy* (July 2015) p 1: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/449593/BIS-15-457-space-weather-preparedness-strategy.pdf [accessed 30 November 2021]

105 Written evidence from Space Environment Impacts Expert Group (SEIEG) ([RSK0056](#))

106 [Q 148](#) (Chris Train)

107 Department for Business, Energy and Industrial Strategy, *UK Severe Space Weather Preparedness Strategy* (September 2021) pp 6-7: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1020551/uk-severe-space-weather-preparedness-strategy.pdf [accessed 30 November 2021]

A culture of secrecy

56. Government policymaking on risk and resilience is opaque. In particular, the process of constructing the National Security Risk Assessment (NSRA) is conducted largely behind closed doors. There is limited independent challenge and much of the scrutiny is provided either by those within government or those appointed by the government. Those producing risk assessments in Government departments should, according to the Cabinet Office, “work collaboratively with experts, including their Chief Scientific Adviser, other departments and agencies, the intelligence community, business and industry stakeholders, and external experts”.¹⁰⁸ There are also nine expert groups, including the Natural Hazards Partnership, who scrutinise some cross-cutting risks. The details of these groups, including membership, are not readily available.¹⁰⁹ This lack of scrutiny was acknowledged by Roger Hargreaves who told us:

“Finding a way to inject some independent challenge is probably our highest priority for the next round ... We have to find a way to get genuinely independent but genuinely expert voices into the process, which inject genuine challenge and fresh thought.”¹¹⁰

57. Witnesses outlined their concerns with the current lack of external challenge. Lord Ricketts, former National Security Adviser, said:

“The risk is that these exercises tend to be held within government and there is probably a lot of value in exposing the national risk process to wider consultation but also the potential policy implications as well through the integrated review.”¹¹¹

58. Charlotte Pickles, director of the Reform think tank, said that: “we do not have nearly enough transparency and we are not nearly open enough to independent challenge on some of the assumptions that we make within our risk identification and assessment process.”¹¹² Dr Harwood also said that “At the moment it certainly feels like debate happens within government and then we are told after decisions have been made.”¹¹³

59. Dr David Blagden, Senior Lecturer in International Security, University of Exeter, acknowledged that there may be good reason for secrecy surrounding some risks, but considered that a blanket approach was not justified:

“There are clearly very good reasons for a degree of secrecy around malicious risks, but when it comes to non-malicious risks, because we are not more public about how we are doing the assessment and what underpins our assessments around likelihood or impact, we are not able to solicit the same degree of independent challenge to those assumptions as we would be if we were more transparent.”¹¹⁴

60. Currently, external challenge is sought in an ad-hoc manner. Professor Watson described the current approach:

108 Private correspondence with the Cabinet Office

109 Private correspondence with the Cabinet Office

110 [Q 7](#) (Roger Hargreaves)

111 [Q 76](#) (Lord Ricketts)

112 [Q 214](#) (Charlotte Pickles)

113 [Q 86](#) (Dr Simon Harwood)

114 [Q 214](#) (Charlotte Pickles)

“What tends to happen often is that it is felt that a subject matter expert is needed to inject into some group that is developing some policy. Perhaps sometimes the country would be better served by creating more persistent teams that combine government, academia and also the private sector in a team that persists, gets to know each other and then can apply its diverse talents across a range of policy development tasks.”¹¹⁵

This view was echoed by Dr Blagden, who called for “some sort of institutionalised mechanism for bringing in non-Whitehall challenge”¹¹⁶, and by Professor Sir David Spiegelhalter, Winton Professor of the Understanding of Risk, Statistical Laboratory, University of Cambridge, who called for a “red team” to challenge the NSRA.¹¹⁷

61. Information security also reduces transparency. The NSRA is held at two classification levels—Official-Sensitive and Secret. The high classification level of the document acts as a barrier to robust risk assessment. The NSRA is not shared publicly.¹¹⁸ Ian Lisk, Chair of the National Hazards Partnership, a consortium of public bodies who scrutinise elements of the NSRA, told us that security clearance and classification are a barrier to the Natural Hazards Partnership discharging its scrutiny duties:

“One challenge we still have is that not all our agencies have the adequate level of clearance to fully review some of the more classified information contained within the national security risk assessment process ... That has proved to be a challenge in terms of being able to do a full review of the complete process from end to end, because some of that information is protected.”¹¹⁹

We were granted permission to view the Official-Sensitive version of the risk assessment in June 2021.

62. **The central government risk assessment process has developed a culture of secrecy that impedes thorough scrutiny, expert consultation and information sharing with key partners. The Committee has seen the Official-Sensitive National Security Risk Assessment (NSRA) and believes that the secrecy surrounding the document is unwarranted and that much of this information does not need to be secret and should be in the public domain. As we discuss in paragraph 79, the Government should welcome greater external expertise and challenge into the process. This would allow the process to be more open to challenge and allow it to draw on independent scientific advice.**

Politics and risk

63. Witnesses identified that the UK’s risk assessment process does not sufficiently address the influence that politics has on risk management. They argued that there is insufficient political involvement in the risk assessment process. They also noted that the UK risk assessment does not consider the risks posed by the consequences of major political decisions.

115 [Q 160](#) (Professor Tim Watson)

116 [Q 90](#) (Dr David Blagden)

117 [Q 258](#) (Lord O’Donnell)

118 [Q 85](#) (Suzanne Raine)

119 [Q 71](#) (Ian Lisk)

64. First, there appears to be limited political involvement within the risk assessment process. This is most clearly seen by the lack of ministerial engagement within risk assessment. The risk assessment process is conducted at official level in government departments. Departmental officials produce assessments of risks in their risk landscape and provide these to the CCS, who then compile and standardise the assessments. Roger Hargreaves told us that they were “pretty sure” that departments would all sign off their final assessments with their Secretary of State” before they are sent to the Cabinet Office.¹²⁰ Following compilation, the risk assessment is put to senior officials and ministers for final sign off. For the 2019 NSRA this sign off was done via the Threats, Hazards, Resilience and Contingencies subcommittee of the National Security Council. The Threats, Hazards, Resilience and Contingencies subcommittee was suspended in July 2019.¹²¹
65. Roger Hargreaves told us that they feel the current risk assessment process is “pleasingly free of any sense of political interference”,¹²² with ministers ultimately making decisions on the basis of the completed official-led risk assessment.¹²³ Lord Ricketts agreed that while some separation between officials and ministers was healthy, there should still be ministerial involvement in the process:
- “Political judgment comes in at the end to validate or question, challenge and change and then validate a list of priorities on the basis of the wider risk assessment process. I think it is healthy if those two stages are kept separate but in the end ministers have to own the risk prioritisation that they set.”¹²⁴
66. Suzanne Raine, Affiliate Lecturer, Centre for Geopolitics at the University of Cambridge, argued that a risk register “is not just bad things that might happen randomly but things that thwart what you are seeking to achieve”.¹²⁵ Suzanne Raine argued that until the Government sets out its strategic plan, it cannot fully assess the risks which may impact that plan.
67. Secondly, there is no consideration of the risks which arise as a result of political decisions. Former Cabinet Secretary Lord O’Donnell noted in his evidence that the assessment of the potential consequences of major constitutional changes or political decisions are not given sufficient evaluation within government. Lord O’Donnell argued that the analysis of political risks should be done “before the time of war, not at the time of war.”¹²⁶ The content of the national risk assessment should reflect all risks facing the country, including the need to identify and mitigate the consequences of major political decisions.
68. The Threats, Hazards, Resilience and Contingencies subcommittee of the National Security Council considered threats, hazards, resilience and contingencies strategy. It worked to coordinate resilience activity across

120 [Q 41](#) (Roger Hargreaves)

121 Private correspondence with the Cabinet Office

122 [Q 2](#) (Roger Hargreaves)

123 [Q 3](#) (Roger Hargreaves)

124 [Q 77](#) (Lord Ricketts)

125 [Q 82](#) (Suzanne Raine)

126 [Q 259](#) (Lord O’Donnell)

Government.¹²⁷ This included the governing of work on critical national infrastructure.¹²⁸ Roger Hargreaves told us that, in light of the disbanding of the Threats, Hazards, Resilience and Contingencies subcommittee, many civil contingency issues were being raised through the current COVID-19 and Brexit governance structures. They said that the question of what structures would emerge post-pandemic remained a live one.¹²⁹

69. **The Government's risk assessment process should not shy away from politics, including in its content, by which we mean ministerial engagement, parliamentary scrutiny and participation by the devolved administrations. It should be driven by the UK's strategic priorities and needs greater ministerial oversight.**
70. ***The Government should re-establish the Threats, Hazards, Resilience and Contingencies subcommittee of the National Security Council, or an equivalent Cabinet Committee, ahead of the production of the next National Security Risk Assessment.***

Risk appetite

71. In most organisations it is usual for senior management to agree the corporate "risk appetite". This is the level of risk it is prepared to accept in pursuit of its objectives before further intervention is needed to try to lower the risk. The approach to risk is balanced with possible opportunities, including financial growth. Our witnesses contrasted this approach with the Government's approach to risk. Dr Adam Marshall, former Director General of the British Chambers of Commerce, noted that: "Government, from our perspective, is generally focused on risk management and elimination of risk, rather than risk awareness and setting risk appetite. That is a fundamental differentiator from the world of business."¹³⁰ But it is impossible to eliminate all risk. Dr Marc Schelhase, Lecturer in the Defence Studies Department at King's College London, stressed the value of setting a risk appetite, saying: "That is why risk appetite is important; it is getting the organisation to think about its priorities."¹³¹
72. Such prioritisation has a further consequence - it creates the climate wherein opportunities as well as threats may be considered side by side. Sir Mark Walport said: "Regulators are held to account if they do not stop something happening that would cause harm. On the other hand, they are not held to account if they stop something happening that would have caused good. There is an asymmetry."¹³²

Long-term approaches to risk

73. The low likelihood associated with some risks means that they may only materialise once a decade or even once a century. Lord Harris of Haringey, Chair of the National Preparedness Commission, questioned whether the current political system, with short parliamentary terms and ministerial postings, allows for the proper consideration of risk:

127 Cabinet Office, *Chapter 13: Support and challenge Revision to Emergency Preparedness* (March 2012) p 17: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/61036/Chapter-13-Support-and-challenge-amends_25042012.pdf [accessed 30 November 2021]

128 CPNI, 'Who we work with': <https://www.cpni.gov.uk/who-we-work> [accessed 22 November 2021]

129 [Q 268](#) (Roger Hargreaves)

130 [Q 163](#) (Dr Adam Marshall)

131 [Q 126](#) (Dr Marc Schelhase)

132 [Q 34](#) (Professor Sir Mark Walport)

“I wonder slightly whether a democratic system, where the issue is “not in my term of office”, enables us to take a long-term view, particularly of some of these very major potential risks that still might not happen.”¹³³

This view was shared by Sir David Spiegelhalter and Dr Alexandra Freeman, of the Winton Centre for Risk and Evidence Communication at the University of Cambridge, who noted that:

“The likelihood of any one of these major risks actually manifesting itself during the term of a government is low, so no government is incentivised to prepare for them: the payoff is unlikely (and there may be some concern that the public perception of preparation for a risk that doesn’t manifest is ‘waste of resources’).”¹³⁴

Risk governance

74. Many of our witnesses called for the establishment of a body within Government which could provide independent challenge to the risk assessment process and place pressure on the Government to undertake the necessary actions to either mitigate or prevent disruptive events.
75. Dr Tim Stone, Chairman of the Nuclear Industry Association, said: “It is about how we make sure that we have a group, properly accountable and independent from electoral cycles, to manage this and to provide real wisdom and public transparency.”¹³⁵ Sir David Spiegelhalter called for a body or person with a high profile and the ability to scrutinise risk preparedness.¹³⁶
76. Sir Oliver Letwin said that such a body needed to be independent and statutorily empowered and Sir David Spiegelhalter described to us what its purpose should be:

“I think the most urgent necessity is for the establishment of an independent statutory public body that will do the things that all three of us have been talking about: create constant attention to these matters, communicate that aggressively with the media, stir it up politically and hold the Government to account on an annual basis on whether actions have been taken in line with its recommendations.”¹³⁷

Professor Brian Collins, Vice-Chair of the National Preparedness Commission, also called for a body to hold the Government to account:

“There would then be a body at arm’s length, but not totally at arm’s length—the length of the arm is critical—which does the joining up of all the actors and holds the feet to the fire, especially if there is some legality involved, of both regulators and Parliament to deliver on ‘joined-upness’.”¹³⁸

77. Some witnesses suggested other governance changes, including the establishment of a dedicated emergency planning agency and a Minister for resilience.¹³⁹ We have concerns that the issues noted above, particularly a

133 [Q 237](#) (Lord Harris of Haringey)

134 Written evidence from Professor Sir David Spiegelhalter and Dr Alexandra Freeman ([RSK0057](#))

135 [Q 141](#) (Dr Tim Stone)

136 [Q 214](#) (Professor Sir David Spiegelhalter)

137 [Q 261](#) (Sir Oliver Letwin)

138 [Q 240](#) (Professor Brian Collins)

139 [Q 91](#) (Dr Simon Harwood); [Q 213](#) (Dr Carina Fearnley); [Q 216](#) (Charlotte Pickles)

lack of incentive to invest against high-impact low-likelihood risks, would not be adequately addressed by the creation of either a new agency or minister. These changes cannot be achieved within the existing Cabinet structure. As Sir Oliver Letwin noted:

“In my view, neither a Minister nor a ministry will ever solve this problem because the Minister and the ministry, if there is one, will be starved of funds in just the same way for just the same reasons and will be powerless. You will never have a Minister at the relevant rank to take on the Chancellor of the Exchequer and the Prime Minister of the day and tell them that they have to spend more on something that is not happening, rather than spending it on something that is happening and that you are worried about.”¹⁴⁰

78. The combination of a culture of secrecy, a lack of transparency, absent or ad hoc external input and challenge, and a high degree of short-termism is hampering the government’s management of risk and resilience.
79. *The Government should establish an Office for Preparedness and Resilience as a non-departmental body, headed by a newly created post of Government Chief Risk Officer. This body would be responsible for producing independent analysis of UK preparedness and monitoring Government preparedness. It would produce assessments of UK resilience, set resilience standards, and conduct audits of UK preparedness. It would have the ability to commission research and establish expert task and finish groups on specific topics to produce expert led reports and assessments. The Office for Preparedness and Resilience should have a standing expert advisory council to provide independent challenge, oversight and strategic direction. It should establish an institutional memory bank, in the form of a digital library, which contains resilience literature and the lessons learned of all major exercises and emergencies. This should be made available to a designated set of users including central Government officials, local responders, the devolved administrations, and parliamentarians.*

Spending on risk and HM Treasury

80. HM Treasury, through its control of public spending and role in setting the direction of economic policy, has a pivotal role to play in UK resilience. Our witnesses were critical of the Treasury’s approach to spending on risk and resilience. Dame Margaret Beckett MP, Chair of the Joint Committee on the National Security Strategy, noted that:

“The thing that, in my experience, has always been the hardest to do—I say this with all due deference to former Treasury Ministers or civil servants—is to get the Treasury to take on board the long-term implications of something, as opposed to what will fly in this year’s Budget or next year’s Budget.”¹⁴¹
81. Lord Ricketts echoed this, saying: “I think the Treasury approach to government spending has tended to make it very hard for departments

140 [Q 253](#) (Sir Oliver Letwin)

141 [Q 253](#) (Dame Margaret Beckett)

to spend to create capacity against a possible need in the future.”¹⁴² They considered that this attitude spread from the Treasury to other departments:

“The problem for government departments, rather prompted by the Treasury, is that they invest money in what is happening right now and they tend not to invest serious money in what might happen but might not.”¹⁴³

Dr Kristen MacAskill, Lecturer in Sustainability, Environment and Engineering at the University of Cambridge, made a similar point, saying that: “funding mechanisms provide support following major events, but disincentivise up-front investment and planning”.¹⁴⁴

82. The Government’s ‘Green Book’ provides guidance on how Government policies, projects and programmes should be appraised and evaluated.¹⁴⁵ In particular, it sets out a framework measuring and comparing future costs and benefits with those that arise today. Costs and benefits in future years are converted to a value in today’s money through a ‘present value’ calculation. This requires a discount rate to be applied to future benefits and costs (discounting). The effect of discounting is to give preference to present benefits over future benefits.¹⁴⁶ The Government’s accounting doctrine including the Green Book and supplementary guidance were criticised by several witnesses as an ineffective way to assess spending on high-impact low-probability risks. Sir Oliver Letwin said that the system of discounting and net present value is “not suited to insurance risk of the kind we are talking about or to the assessment of black swan events and their consequences.”¹⁴⁷ Lord Ricketts called for a “change of government accounting methodology and doctrine.”¹⁴⁸
83. A policy intervention or emergency plan can be based on rigorous and robust assessment, but that is of little value if it isn’t properly funded. ALARM, a professional association for risk and insurance practitioners in UK public services, noted that: “Risk assessment is only one element of the process. It is no good understanding what the risks are unless there is commitment and funding to put appropriate mitigation measures in place.”¹⁴⁹
84. Research suggests that investing in risk reduction and resilience yields economic benefits which are greater than costs.¹⁵⁰ Research on the benefit-cost ratio of disaster risk reduction has estimated that, on average, the benefits of disaster risk reduction are approximately four times the costs

142 [Q 80](#) (Lord Ricketts)

143 [Q 71](#) (Lord Ricketts)

144 Written evidence from Kristen MacAskill ([RSK0046](#))

145 HM Treasury, ‘The Green Book and accompanying guidance and documents’: <https://www.gov.uk/government/collections/the-green-book-and-accompanying-guidance-and-documents> [accessed 22 November 2021]

146 House of Lords Library, ‘Government investment programmes: the ‘green book’’: <https://lordslibrary.parliament.uk/government-investment-programmes-the-green-book/> [accessed 22 November 2021]

147 [Q 258](#) (Sir Oliver Letwin)

148 [Q 72](#) (Lord Ricketts)

149 Written evidence from ALARM ([RSK0079](#))

150 K4D, *Cost-effectiveness of disaster risk reduction and adaptation to climate change* (February 2018) p 3: https://assets.publishing.service.gov.uk/media/5ab0debce5274a5e20ffe268/274_DRR_CAA_cost_effectiveness.pdf [accessed 30 November 2021]

in terms of avoided and reduced losses.¹⁵¹ This is particularly the case for climate adaptations where the benefits substantially outweigh the costs, with some adaptations having benefit-to-cost ratios of 10:1 or more.¹⁵² Dr Carina Fearnley, Associate Professor, Science and Technology Studies Department, and Director, UCL Warning Research Centre, University College London, described spending on disaster preparedness as “a phenomenal investment.”¹⁵³

85. When proposed mitigations and plans are unfunded or underfunded, the impact of a disruptive event is likely to be greater and it is more likely the emergency response will be developed in haste as the event plays out, being made up as we go along. The failure to invest adequately against risks which the UK faces represents a significant vulnerability.
86. Our witnesses suggested that spending on risk needs to be more tightly linked to risk assessment and risk planning to ensure that spending is proportionate to the severity of the risk. Lord Harris noted that it is often unclear whether the sums of money allocated to tackle risks are in fact sufficient: “The National Risk Register talks about £5 billion or £6 billion being spent on flood relief. What you cannot see, and perhaps there is detailed working somewhere else, is whether that £5 billion or £6 billion is the right sum of money.”¹⁵⁴ Without sight of the evidence and calculations used, it is not possible to say whether government investments are sufficient. Professor Sir John Beddington, former Government Chief Scientific Adviser, suggested that funding should be more closely linked to the NSRA, saying: “the possibility of a degree of separate funding for the National Risk Register, so that resources are correlated appropriately with the position on the risk matrix, makes a lot of sense to me.”¹⁵⁵
87. Elements of our national infrastructure, such as dams, bridges and power stations, degrade over time and require maintenance or replacement to ensure they are not at risk of failure. This is particularly relevant for critical national infrastructure which is essential for the functioning of the society and economy. Any compromise or loss of critical national infrastructure could lead to the disruption of essential services or threaten national security, leading to a loss of life, casualties, or significant social or economic impact. Dr Tim Stone outlined the need to measure and publish information on this degradation of infrastructure so we can be sure that the full lifecycle of assets is being managed. Dr Stone told us:

“Where can I find a two-page summary of the remaining useful life of nationally significant assets, which is updated every year and which shows me how they are declining or not? Without visibility of measurement, you will not get management.”¹⁵⁶

151 K4D, *Cost-effectiveness of disaster risk reduction and adaptation to climate change* (February 2018) p 3: https://assets.publishing.service.gov.uk/media/5ab0debce5274a5e20ffe268/274_DRR_CAA_cost_effectiveness.pdf [accessed 30 November 2021]

152 Climate Change Committee, *Independent Assessment of UK Climate Risk* (June 2021) p 27: <https://www.theccc.org.uk/wp-content/uploads/2021/07/Independent-Assessment-of-UK-Climate-Risk-Advice-to-Govt-for-CCRA3-CCC.pdf> [accessed 30 November 2021]

153 Q 212 (Dr Carina Fearnley)

154 Q 237 (Lord Harris of Haringey)

155 Q 31 (Professor Sir John Beddington)

156 Q 141 (Dr Tim Stone)

Lord Harris also noted the need for a baseline assessment of infrastructure resilience, from which decisions on spending could be made.¹⁵⁷ It is critical that in doing so the whole system is considered rather than focusing on a single asset. Chris Train, former CEO of Cadent, cautioned that: “There is a risk of looking at individual asset resilience rather than systemic resilience”.¹⁵⁸ Lord Harris also warned of a failure “to invest adequately in the maintenance of critical infrastructure, with no one agency responsible for the effects on the system.”¹⁵⁹ An example of the potential harm caused by the deterioration of infrastructure and a lack of maintenance can be seen in the collapse of the Ponte Morandi bridge in Genoa in 2018, causing the death of 43 people.¹⁶⁰

88. **The Government has a strong disincentive to invest against possible risks, but prevention is significantly cheaper than cure and a failure to invest in mitigation can cause an increase in likelihood and impact. Government spending should, where possible, be directed towards preventing or mitigating disaster. Business cases must represent the future benefits of preparedness and mitigation, as well as the costs. The discounting rates required by the Treasury’s ‘Green Book’ favour short-term gains and are disincentivising risk spending in risk management. Elements of critical national infrastructure (CNI) degrade over time, but this is not adequately accounted for within the current risk management system.**
89. *The Treasury and spending departments must move away from their current practice of disincentivising long-term, preventative spending on risk. To address this, the Government should establish a flexible and evidence-based spending target for spending on resilience. This funding target should be based on the required capabilities and proposed mitigations outlined by the new Office for Preparedness and Resilience which we have recommended in paragraph 79. This should be assisted by an appropriate depreciation register for Critical National Infrastructure which identifies ageing infrastructure.*

Skills and capabilities

90. Ensuring national resilience includes ensuring that the requisite capabilities are in place to deal with an event when it transpires. As Deborah Higgins, Head of the Emergency Planning College, noted:

“... the key to all of this is preparing people and building those capabilities, so that, when we are faced with something, we can respond competently and make those judgments and decisions based on the set of circumstances in front of us.”¹⁶¹

Some of these capabilities are generic, including flexibility, adaptability and incisiveness.¹⁶² Our witnesses also stressed the importance of a diversity

157 [Q 237](#) (Lord Harris of Haringey)

158 [Q 151](#) (Chris Train)

159 [Q 235](#) (Lord Harris of Haringey)

160 ‘What caused the Genoa bridge collapse – and the end of an Italian national myth?’, *The Guardian* (26 February 2019): <https://www.theguardian.com/cities/2019/feb/26/what-caused-the-genoa-morandi-bridge-collapse-and-the-end-of-an-italian-national-myth>

161 [Q 181](#) (Deborah Higgins)

162 [Q 257](#) (Sir Oliver Letwin)

of thought and background to help guard against groupthink.¹⁶³ These capabilities and a diversity of background, thinking and approach, are a benefit to the response to any event and should be cultivated and valued.

91. Some of the capabilities required are more specific, and a number of these were highlighted to us as being absent or scarce in Government. Professor Sir Stephen Sparks, Professor of Geology at the University of Bristol, and Professor Willy Aspinall, Cabot Professor in Natural Hazards and Risk Science at the University of Bristol, said that there is “nationally and internationally a critical shortage of professionals trained in risk science”.¹⁶⁴ Professor Brooke Rogers, Professor of Behavioural Science and Security, Department of War Studies at King’s College London, highlighted that emergency planning skillsets are lacking in Government, with preparedness, response and recovery often just one aspect of an official’s job.¹⁶⁵ Lord O’Donnell noted there are shortages in procurement and digital skills.¹⁶⁶ Suzanne Raine suggested that the Government’s analysis function is under-valued and under-resourced:

“The problem is that the thing that we esteem in government is either the collecting of information or doing something with the information. The thinking bit is the bit that often is simply not in the conversation.”¹⁶⁷

Witnesses cited several causes for these skills gaps including poor remuneration, a lack of value placed on these skills and a lack of career progression and development opportunities.¹⁶⁸

92. Sir Oliver Letwin disagreed with the assessment that there are any specific skills shortages in Government, instead considering that what was lacking was the ability to locate and organise individuals with the relevant skills for a particular crisis. Sir Oliver said that “I do not buy the thesis that we do not have the skill, by and large; I think what we do not have is the organisation.”¹⁶⁹
93. Sir Oliver Letwin conceded that there is a discrepancy in some areas between the skills held by civil departments and those held by the military.¹⁷⁰ Other witnesses too noted that the Ministry of Defence has many of these skills, including in logistics and delivery, and that these skills have been provided in support of emergency responses through Military Aid to the Civil Authorities (MACA).¹⁷¹ They warned, however, that this support should not be used to plug longstanding skills gaps within wider government and that the UK has been fortunate that defence forces have been able to meet their need for military support.¹⁷²
94. Witnesses suggested that the use of Futures techniques and systems thinking would help policymakers to think more long-term and systematically about a specific policy area.

163 [Q 177](#) (John Curry), [Q 138](#) (Professor Richardson), [Q 51](#) (Dr Simon Beard), [Q 238](#) (Lord Harris of Haringey)

164 Written evidence from Professor Sir Stephen Sparks and Professor Willy Aspinall ([RSK0019](#))

165 [Q 212](#) (Professor Brooke Rogers)

166 [Q 257](#) (Lord O’Donnell)

167 [Q 87](#) (Suzanne Raine)

168 [Q 87](#) (Suzanne Raine); [Q 212](#) (Professor Brooke Rogers); [Q 257](#) (Lord O’Donnell)

169 [Q 257](#) (Sir Oliver Letwin)

170 [Q 257](#) (Sir Oliver Letwin)

171 [Q 257](#) (Sir Oliver Letwin); [Q 35](#) (Professor Sir Mark Walport)

172 [Q 120](#) (Dr Marc Schelhase); [Q 189](#) (Dr Marc Schelhase); [Q 120](#) (Sir Chris Deverell)

Box 4: Futures, Foresight and Horizon Scanning

Futures, Foresight and Horizon Scanning are all terms used when describing policymaking which considers the future. The Government Office for Science document 'A brief guide to futures thinking and foresight' defines the three terms as:

Futures: refers to different approaches to thinking about the future and exploring factors that could give rise to possible and probable future characteristics, events and behaviours.

Foresight: refers to the tools/methods for conducting futures work, for example, horizon scanning (gathering intelligence about the future) and scenarios (describing what the future might be like).

Horizon scanning: a systematic examination of information to identify potential threats, risks, emerging issues and opportunities, beyond the Parliamentary term, allowing for better preparedness and the incorporation of mitigation and exploitation into the policy making process.

Source: Government Office for Science, *Futures thinking and foresight: a brief guide* (February 2021) p 3: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/964195/A_brief_guide_to_futures_thinking_and_foresight.pdf [accessed 30 November 2021]

95. Many witnesses praised the value of futures tools and techniques including horizon scanning and scenarios and suggested that they should be embedded in the risk assessment and risk planning process.¹⁷³ Futures and foresight are extensively used within the Singaporean Government, with scenario planning tied to strategy and the budgetary cycle.¹⁷⁴ However, Dr Simon Beard, Academic Programme Manager and Senior Research Associate, Centre for the Study of Existential Risk at the University of Cambridge, cautioned against being misled by the “hype” around futures and foresight.¹⁷⁵ Dr Beard suggested that successful futures work should be transparent, open to challenge and involve a diverse group of participants.¹⁷⁶
96. Systems thinking is defined by the Government Office for Science as: “a holistic approach to analysis that focuses on the way that a system’s constituent parts interrelate, how systems work over time and within the context of larger systems”.¹⁷⁷ Professor Stephen Richardson, Emeritus Professor of Chemical Engineering at Imperial College, outlined the benefits of systems thinking in understanding the relationships between elements of a system. Professor Richardson noted that “Systems thinking is not just a good thing but is absolutely essential when you are looking at the risks associated with any installation or anything you are doing that is more than making a piece of toast.”¹⁷⁸ Dame Sue Ion, Honorary President, National Skills Academy for Nuclear, said: “We need to do a lot better on systems thinking overall, not just for the immediate risks but also in things like the future energy systems,

173 [Q 51](#) (Dr Simon Beard); Written evidence from the Centre for the Study of Existential Risk ([RSK0063](#)); [Q 19](#) (Dr Piers Millett)

174 [Q 200](#) (Peter Ho)

175 [Q 51](#) (Dr Simon Beard)

176 [Q 51](#) (Dr Simon Beard)

177 Government Office for Science, *Futures thinking and foresight: a brief guide* (February 2021) p 5: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/964195/A_brief_guide_to_futures_thinking_and_foresight.pdf [accessed 30 November 2021]

178 [Q 136](#) (Professor Stephen Richardson)

with the linkages between the different sorts, such as renewables, nuclear and hydrogen.”¹⁷⁹

97. Many of these skills and qualities are needed by ministers as well as the officials advising them. Penny Mordaunt MP, the then Paymaster General, was clear about the need for ministerial training, saying:

“... we need to invest more in induction, training, flexion and exercising with ministers. Ministers are the most transient part of the team, but they are an incredibly important link and, ultimately, they are the ones at the table, so we need to ensure that they know what they should be doing and are equipped to do that job well.”¹⁸⁰

98. **Ensuring those responsible for the creation and execution of plans have the appropriate skills and qualities, including flexibility and adaptability, is vital for their success. This applies not just to the Government, but is a challenge for all of society. Within Government this includes ministers as well as officials. There should be a diverse range of individuals involved as diversity of background, thinking and approach are a benefit to resilience policymaking. We highlight the need for a greater focus within Government on analysis skills, emergency planning skills and project delivery skills in the civil sphere. The skills required are determined by the risk in question and change over time. An analysis of future skill requirements is needed to ensure that the Government has the rolling capability to deal with emerging threat scenarios.**
99. *The Government should bolster its skills base in the areas of analysis, emergency planning and project delivery and make more use of systems thinking and Futures techniques when conducting risk assessments and developing policy. This will require offering high quality, targeted training, skill-based allowances, defined career paths, and making use of the full breadth of pay bands where market needs justify this. In developing the requisite capabilities, the Government should ensure it builds and maintains staff diversity. There must be more ministerial engagement in risk preparedness. The Government should provide guidance and implement training for ministers on planning and crisis response. These skills should also be cultivated and properly organised in broader society to bolster general resilience.*

Risk and resilience on an international stage

100. Risks are rarely confined to a single country; events which transpire abroad can have significant impacts on the UK. As the Centre for the Study of Existential Risk noted: “As many extreme risks are global in nature, national risk mitigation efforts should also include pursuing international agreements and action”.¹⁸¹ Witnesses questioned the UK’s ability to manage events which start abroad, or which are global in nature. Dr Piers Millett, Senior Research Fellow at the Future of Humanity Institute, University of Oxford, told us: “The UK is much more prepared for a localised event than a national or an

179 [Q 136](#) (Dame Sue Ion)

180 [Q 263](#) (Penny Mordaunt MP)

181 Written evidence from the Centre for the Study of Existential Risk ([RSK0063](#))

international event.”¹⁸² Dr Opi Outhwaite, Associate Professor in Law, St Mary’s University, Twickenham, criticised the Government’s understanding of how risks that emerge abroad can impact the UK. Dr Outhwaite said that the 2018 Biological Security Strategy: “did not properly understand that a zoonotic pandemic would reach the UK. We heard these things repeatedly characterised as unprecedented. They were not unprecedented.”¹⁸³

101. Several witnesses agreed that many of the required structures and bodies needed for productive international collaboration already exist.¹⁸⁴ Lord Ricketts warned against the creation of new bodies and instead encouraged the revitalisation of existing networks:

“I think the networks of co-operation exist. I am a bit reluctant to start thinking about wholly new structures as a result of the pandemic. We need to ensure that what we have works better than it has done in the recent past.”¹⁸⁵

However, Dr Millett raised concerns that the UK is not as actively engaged with these international forums as it has been previously because of a reduction in resourcing and a loss of institutional memory due to staff turnover.¹⁸⁶

102. Witnesses called for the UK to take a more active role internationally. They encouraged the Government to see international engagement as an opportunity for the UK to be a leader in certain areas. Dr Stephen Cave, Executive Director at the Leverhulme Centre for the Future of Intelligence, University of Cambridge, Dr Simon Beard, Caroline Gorski, Director of R2 Data Labs at Rolls-Royce and John Thornhill, Innovation Editor at the Financial Times, all highlighted the value of international efforts to tackle the risks posed by AI.¹⁸⁷ Dr Cassidy Nelson, Co-Lead of the Biosecurity Research Group at the Future of Humanity Institute at the University of Oxford, called for the UK to take a leading role in addressing biological threats which can impact across national boundaries.¹⁸⁸ Sir Patrick Vallance noted that the response to biosecurity issues such as the threat posed by level 4 labs and rogue actors must be led by multinational bodies with influence from the UK as a science superpower.¹⁸⁹ Sir Patrick called for the establishment of a global surveillance scheme for diseases and data sharing agreements to ensure new infectious diseases can be identified rapidly and information about them shared with ease. They stressed that this should be led by the WHO and requires “long-term sustained funding”.¹⁹⁰
103. The call for evidence for The National Resilience Strategy contains a section on ‘Resilience in an interconnected world’ which acknowledges that “We cannot consider our national resilience in isolation from the rest of the world. This interconnectedness means that both challenges and opportunities are more frequently experienced on either a transnational or global scale.” and calls for views on “how and where we might further leverage and strengthen

182 [Q 16](#) (Piers Millett)

183 [Q 94](#) (Dr Opi Outhwaite)

184 [Q 25](#) (Piers Millett), [Q 79](#) (Lord Ricketts)

185 [Q 79](#) (Lord Ricketts)

186 [Q 25](#) (Piers Millett)

187 [Q 44](#) (Piers Millett)

188 [Q 103](#) (Dr Cassidy Nelson)

189 [Q 290](#) (Sir Patrick Vallance)

190 [Q 290](#) (Sir Patrick Vallance)

international capabilities to support our collective resilience and that of our citizens at home.”¹⁹¹

191 Cabinet Office, *The National Resilience Strategy: A Call for Evidence* (July 2021) p 31: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1001404/Resilience_Strategy_-_Call_for_Evidence.pdf [accessed 30 November 2021]

Box 5: Biological security, bioterror and bio-error

The COVID-19 case study within this report outlines the consequences of a naturally occurring viral pandemic. In the wake of this pandemic, the UK must be alive to the reality that malign actors may use biological material to inflict harm on populations around the world. Malicious biological attacks are not a new threat, and the Government include the risk of biological attack within the National Risk Register.¹⁹² However, the COVID-19 pandemic has provided renewed evidence of the deadly potential of this type of weaponry, and the risks of bioterror and bio-error loom larger than ever.¹⁹³

A biological risk could arise through deliberate action or by accident - bioterror or bio-error. In 2001, powdered anthrax spores were deliberately put into letters that were mailed through the US postal system killing five individuals and infecting 22 people.¹⁹⁴ In July 1971, fisherman in the Aral Sea were infected with smallpox after a laboratory leak from a Soviet Union biological weapons laboratory.¹⁹⁵ In this case, bio-error, as an accidental by-product of weaponizing biological matter, threatened to re-introduce smallpox into global circulation. In today's globalised world, the deliberate or accidental introduction of biological material could cause fast-moving and far-reaching devastation.

Dual use research, defined as research that can have beneficial purposes but could also be used by actors to cause harm,¹⁹⁶ increases the magnitude of threat posed by bioterrorism. Advances in synthetic biology have made the creation of new, deadly biological weapons more achievable, including the ability to recreate a known pathogenic virus and make existing bacteria more dangerous.¹⁹⁷

Despite the risk posed by dual-use technologies, global oversight is limited. Dr Opi Outhwaite argued that our current governance of biosecurity needs to change to be more “outward looking”¹⁹⁸ and Dr Cassidy Nelson said that: “We do not have oversight of that [dual-use research] industry.”¹⁹⁹ The necessity of international collaboration on biological security supports the recommendation we draw in paragraph 107.

192 Cabinet Office, *National Risk Register* (December 2020) p 9: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/952959/6.6920_CO_CCS_s_National_Risk_Register_2020_11-1-21-FINAL.pdf [accessed 30 November 2021]

193 Bioterrorism is the deliberate release of viruses, bacteria or other agents used to cause illness or death in people, but also in animals or plants. Bio-error is a mistake of biological science that endangers humankind. Biological security is the term used by the UK Government to cover the protection of the UK from all types of biological risk, both accidental and deliberate. H. J. Jansen, F. J. Breeveld, C. Stijns and M. P. Grobusch, ‘Biological warfare, bioterrorism and biocrime’, *Clinical Microbiology and Infection*, vol. 20, issue 6, (2014), pp. 488–496: <https://reader.elsevier.com/reader/sd/pii/S1198743X14641732?token=24951C1AC41B5C563493A21AA80591A2AF5976A2A4705EB5B76219F14E999D0BD879F0CCDA312642F173800A33BCA4F3&originRegion=eu-west-1&originCreation=20211201122317> [accessed 30 November 2021]

194 Centres for Disease Control and Prevention, ‘Anthrax’: <https://www.cdc.gov/anthrax/bioterrorism/threat.html> [accessed 22 November 2021]

195 Centre for Biosecurity and Biopreparedness, *Biological security threats* (2016) p. 8: https://www.biosecurity.dk/fileadmin/user_upload/PDF_FILER/Rapporter/CBB_004_trusselsbillede_UK_WEB.pdf [accessed 30 November 2021]

196 Q 96 (Dr Cassidy Nelson)

197 The National Academies of Sciences, Engineering and Medicine, ‘If Misused, Synthetic Biology Could Expand the Possibility of Creating New Weapons; DOD Should Continue to Monitor Advances in the Field, New Report Says’: <https://www.nationalacademies.org/news/2018/06/if-misused-synthetic-biology-could-expand-the-possibility-of-creating-new-weapons-dod-should-continue-to-monitor-advances-in-the-field-new-report-says> [accessed 22 November 2021]

198 Q 102 (Dr Opi Outhwaite)

199 Q 96 (Dr Cassidy Nelson)

104. International engagement also represents an opportunity for the UK to learn from the examples of other countries. The Greater Manchester Combined Authority highlighted the value of international networks which “enable a sharing learning, understand different conceptualisations of risk, and help drive collaborative activity both within the UK and abroad.”²⁰⁰ Lord O’Donnell encouraged more learning from other countries:

“We should be absolutely clear that these are global issues, mostly, and that we should learn from other countries. Has anyone else set up a body like this? Is there something out there that is working well? I do not know. I have not done that research. Our view about always creating our own stuff, rather than dealing with product from others, is a bit of a mistake, I think.”²⁰¹

105. There are many examples of best practice which could be closely studied and drawn from. Witnesses praised the approaches taken by Canada, Australia, and New Zealand.²⁰² In particular, the ‘Total Defence’ concept used by both Sweden and Singapore was commended as promoting a whole-of-society approach to preparedness and resilience.²⁰³
106. **Risks do not respect national borders. They are likely to have international impacts and will require international responses. UK risk planning needs to acknowledge how interconnected the world is and work internationally to plan for risk. Such engagement is an opportunity not only for the UK to pursue its policy agenda but also to learn from international partners. A strong UK involvement in international forums is necessary to mitigate against the risks faced by the UK and ensure risk planning considers international dimensions and is not narrowly focused on domestic issues. International agreements and research partnerships will be necessary to ensure some risks are mitigated effectively, for example the threat posed by Level 4 biolabs.**
107. *We are encouraged by the inclusion of global risks and international partnerships in the Government’s call for evidence for The National Resilience Strategy. The Government must ensure that the strategy clearly outlines how it will engage in international forums and what international agreements it would like to see implemented and refreshed. It should clearly lay out what resource it will devote to these efforts and commit long term funding. In particular, the Research Councils should give additional focus to projects which explore the international dimensions of risks. The Government should work with international partners to establish a global surveillance scheme for disease and establish data sharing agreements to ensure new infectious diseases can be identified rapidly and information about them shared with ease.*

200 Written evidence from the Greater Manchester Combined Authority ([RSK0072](#))

201 [Q 256](#) (Lord O’Donnell)

202 Written evidence from the Warwick Manufacturing Group (WMG), University of Warwick ([RSK0059](#)); Written evidence from Dr Simon Webster ([RSK0014](#)); Written evidence from Dr Kristen MacAskill ([RSK0046](#)); Written evidence from Professor Jim Hall, Dr Raghav Pant, Dr Ed Oughton, Dr Elco Koks, Dr Edoardo Borgomeo, Dr Scott Thacker, and Tom Russell ([RSK0052](#))

203 [Q 43](#) (John Thornhill); [Q 157](#) (Elisabeth Braw)

CHAPTER 4: A WHOLE OF SOCIETY APPROACH

108. Within the Government's Integrated Review commitment to develop a comprehensive national resilience strategy, it prioritises the establishment of "a 'whole-of-society' approach to resilience, so that individuals, businesses and organisations all play a part in building resilience across the UK."²⁰⁴ We welcome this approach. The current UK risk and resilience landscape is fragmented and elements such as business and industry, the voluntary sector and the public are underused.
109. The Government has established the UK Resilience Forum (UKRF) to "strengthen UK resilience by improving communication and collaboration on risk, emergency preparedness, crisis response and recovery". It includes representatives of national, regional and local government, private and voluntary sectors.²⁰⁵

Whole of society approaches internationally

110. Many countries take a whole of society view of resilience. During the course of our inquiry, we took evidence from several international representatives to understand how their countries approached risk and resilience.
111. Sweden makes use of a 'total defence' concept which "makes peacetime emergency preparedness and resilience a basis for wartime defence planning."²⁰⁶ When the highest state of alert is declared, all elements of society, including the parliament, Government, government authorities, municipalities, private enterprises, voluntary defence organisations, and individuals, are engaged in the defence effort. Our witnesses praised the Swedish 'total defence' model for its efforts to mobilise the whole of society in pursuit of national resilience and defence.²⁰⁷ Jim Kronhamn, Acting Head of the Research and Evaluation Section, Swedish Civil Contingencies Agency, told us:
- "In Sweden, there is a strong tradition of seeing people as subjects rather than objects, as resources and not care-needing entities. We are all subjects and decision-makers who can make a difference for ourselves and the wider society. This mindset is something that I believe is a strength in our approach to managing risks"²⁰⁸
112. Singapore also uses a 'total defence' model. Peter Ho, Senior Adviser, Centre for Strategic Futures, Prime Minister's Office, Singapore, said that: "Total defence starts from the premise that it is the whole system that is being organised."²⁰⁹ In Singapore, emergency exercises are regularly run at a community level to inform and train the public. Peter Ho stressed the value of these exercises, and said: "by getting the whole community involved

204 Cabinet Office, *Global Britain in a Competitive Age: the Integrated Review of Security, Defence, Development and Foreign Policy*, CP 403 (March 2021), p 88: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/975077/Global_Britain_in_a_Competitive_Age-the_Integrated_Review_of_Security_Defence_Development_and_Foreign_Policy.pdf [accessed 30 November 2021]

205 Cabinet Office, 'Meeting notes for UK Resilience Forum': <https://www.gov.uk/government/publications/meeting-notes-for-uk-resilience-forum> [accessed 22 November 2021]

206 Q 195 (Jim Kronhamn)

207 Q 157 (Elisabeth Braw); Q 47 (John Thornhill)

208 Q 205 (Jim Kronhamn)

209 Q 196 (Peter Ho)

you are not just bringing a sense of commitment to society but getting a commitment to building resilience in society”.²¹⁰

113. In developing a whole of society approach to resilience, it will be important to take note of and draw on what has worked internationally. Throughout this chapter we have drawn from the experiences and views of both domestic and international partners.

The local level

The purpose and role of Local Resilience Forums

114. The UK’s approach to resilience is described as being based on the principle of subsidiarity, “where decisions and responsibilities should rest at the lowest appropriate level, with collaboration and co-ordination at the highest level necessary”.²¹¹ In England, Local Resilience Forums (LRFs) are the building block for emergency planning activities. LRFs are multi-agency partnerships who work to plan and prepare for localised incidents and emergencies, identifying risks and producing emergency plans.²¹² LRFs are not legal entities, but rather forums through which local responders discharge their duties under the Civil Contingencies Act 2004.²¹³
115. Our witnesses noted that the risk landscape and expectations on LRFs have changed substantially since they were defined in the Civil Contingencies Act 2004.²¹⁴ Dr Fiona Twycross, Deputy Mayor for Fire and Resilience and Chair at London Resilience Forum, told us that: “It was essentially designed to deal with civil contingencies, mainly short-term emergencies, whereas the thinking has now moved to a broader resilience agenda.”²¹⁵ Dr Twycross noted that:
- “In some ways, it feels as if LRFs have become the default tasking mechanism in central government for anything that falls outside existing responsibilities or known routes for resolution. The Government need to determine, first, what they want LRFs to do, and then put them on the appropriate statutory footing.”²¹⁶
116. This was echoed by Chief Constable Rachel Swann, Chief Constable of Derbyshire Constabulary and Chair of Derbyshire LRF, who also called for LRFs to be placed on a more secure statutory footing.²¹⁷ Stuart Marshall, Chief Emergency Planning Officer and LRF Manager, Cleveland Local Resilience Forum, also noted that LRFs are increasingly being used as responders, a responsibility which is not reflected in the Civil Contingencies

210 Q 199 (Peter Ho)

211 Cabinet Office, *The role of Local Resilience Forums: A reference document* (July 2013) p 12: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/62277/The_role_of_Local_Resilience_Forum- A_reference_document_v2_July_2013.pdf [accessed 30 November 2021]

212 Cabinet Office, ‘Local resilience forums: contact details’: <https://www.gov.uk/guidance/local-resilience-forums-contact-details> [accessed 22 November 2021]

213 Cabinet Office, ‘Preparation and planning for emergencies: responsibilities of responder agencies and others’: <https://www.gov.uk/guidance/preparation-and-planning-for-emergencies-responsibilities-of-responder-agencies-and-others> [accessed 22 November 2021]

214 Q 222 (Chief Constable Rachel Swann)

215 Q 222 (Dr Fiona Twycross)

216 Q 222 (Dr Fiona Twycross)

217 Q 222 (Chief Constable Rachel Swann)

Act. Stuart Marshall warned that this raised issues about the required training and potential liabilities which should be addressed.²¹⁸

117. Evidence also suggested that the Civil Contingencies Act should be updated to reflect the importance of several societal organisations that are not recognised in the Act. Stuart Marshall told us that organisations such as higher education providers, the voluntary sector and social housing providers had been essential to the COVID-19 response. They are not recognised in the Act and, consequently, information sharing and co-ordination during the pandemic was done only on a best endeavours basis.²¹⁹
118. An independent review of the Civil Contingencies Act and its associated regulations and guidance is being undertaken by the National Preparedness Commission.²²⁰ The Government are legally obligated to review the Civil Contingencies Act (Contingency Planning) Regulations 2005 quinquennially. The next review is due to be completed by March 2022.²²¹
119. **LRFs currently do not have clarity about their purpose and expected duties. The expectations of LRFs have grown and shifted over time which has not been reflected in the Civil Contingencies Act, its associated regulations or guidance.**
120. *As part of the quinquennial review of the CCA regulations, due to report by March 2022, the Government should clarify the purpose and duties of the LRFs and should place them on a statutory footing. If LRFs are to take a more active role in emergency response, the training required, and possible liabilities increased by this change should be addressed. The UK Government in its review of the CCA should expand the range of named category 2 responders.*

Governance and engagement

121. The lines of accountability for LRFs are complex. While the Civil Contingencies Secretariat (CCS) has responsibility for the National Security Risk Assessment (NSRA) and associated programmes, the lead Government department for LRFs is the Department for Levelling Up, Housing and Communities. This confusion was raised by Helen Burton, LRF support officer at West Mercia Resilience Forum, who said that: “CCS as the lead HMG Dept for the NSRA, set against [the Department for Levelling Up, Housing and Communities] being the significant driver of the work through LRFs creates confusion and conflict.”²²² John Barradell, Chief Executive at the City of London Corporation and Deputy Chair, London Resilience Forum, noted that much of the contact was driven by the Department for Levelling Up, Housing and Communities:

“The Civil Contingencies Secretariat, while driving the policy and occasionally coming to us as individuals, actually takes more of a hands-

218 Q 222 (Stuart Marshall)

219 Q 222 (Stuart Marshall)

220 National Preparedness Commission, ‘An independent review of the Civil Contingencies Act (2004)’: <https://nationalpreparednesscommission.uk/2021/07/an-independent-review-of-the-civil-contingencies-act-2004/> [accessed 22 November 2021]

221 Cabinet Office, *The National Resilience Strategy: A Call for Evidence* (July 2021), p 7: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1001404/Resilience_Strategy_-_Call_for_Evidence.pdf [accessed 30 November 2021]

222 Written evidence from Helen Burton (LRF support officer at West Mercia Resilience Forum) (RSK0078)

off and strategic role; the day-to-day involvement and liaison is done by [the Department for Levelling Up, Housing and Communities].”²²³

122. When discussing the engagement between LRFs and the CCS, representatives of LRFs expressed a unanimous view that the current level of contact is not sufficient.²²⁴ John Barradell told us that London Resilience would “bite hands off” to get more contact with the CCS.²²⁵ Witnesses described a predominantly one-way flow of information and inconsistent engagement.
123. LRF representatives called for greater coordination and information sharing among LRFs. Stuart Marshall told us:

“Give us the opportunity to co-ordinate the work between ourselves, facilitated with the ongoing work by national government. There is often a high level of duplication. We can learn from each other, but currently that LRF-to-LRF relationship is not co-ordinated and is not structured.”²²⁶
124. **The UK’s risk assessment system is too top-heavy. LRFs do not have sufficient contact with the CCS and are not viewed as trusted partners in the process. Information flow and communication is currently poor and the direction of information flow between national and local level is largely one-directional. A national system which cannot account for local knowledge is not good enough. There is a need to facilitate the sharing of expertise and information across LRFs.**
125. *The Government should improve its communication and engagement with local authorities and LRFs. In particular, the Government should establish a forum for the seamless sharing of information among LRFs, facilitated by central government. This forum would allow for the sharing of completed risk assessments and best practice insights both among LRFs and from LRFs to central government. This forum should meet at least twice yearly. It should be convened before the production of the NSRA to allow LRFs to contribute insights on the methodology and local risk information, and after the NSRA has been produced to allow LRFs to share local risk assessments and prevent duplication.*

Funding of Local Resilience Forums

126. As noted in paragraph 119, the expectations on LRFs have increased in recent years. However, this increase in responsibility has not been matched by increased funding. A report by the National Audit Office noted that local authorities’ spending power had fallen 28.6% in real terms between 2010–11 and 2017–18, primarily driven by a 49.1% reduction in Government funding over the same period.²²⁷ This has filtered through to emergency planning, with a report by the Institute for Government finding that local authority

223 Q 224 (John Barradell)

224 Q 224 (John Barradell)

225 Q 224 (John Barradell)

226 Q 227 (Stuart Marshall)

227 NAO Blog, ‘Local Government in 2019: a pivotal year’: <https://www.nao.org.uk/naoblog/local-government-in-2019/> [accessed 22 November 2021]

emergency planning expenditure in 2018–19 was 35% lower in real terms than in 2009–10.²²⁸

127. Our witnesses from LRFs were unanimous in their view that LRFs need funding which is proportionate to the responsibilities placed upon them. Stuart Marshall told us: “one of the biggest obstacles is the resource at the current time. We are geared up for the Act as it was in 2004; we are not geared up for the additional guidance and depth that has now been identified.”²²⁹ Dr Twycross told us: “LRFs need the resources to operate, and that includes funding, trust and information.”²³⁰
128. It should be noted that despite their shared purpose and role, the capabilities and experiences of LRFs across England can vary significantly. This was noted by John Barradell who said: “an important distinction here is the difference in LRFs across the country. It would be difficult to draw assumptions across London, Cumbria and other LRFs, for instance. One of the defining characteristics here is difference of scale and complexity.”²³¹ It is important that these differences be accounted for in allocating funding.
129. **Expectations on Category 1 responders have increased since the CCA entered into law. The CCA was designed to respond to short-term emergencies, but the responsibilities placed on LRFs are now more in line with a resilience agenda. LRFs have become a default tasking mechanism for resilience policy at a local level. Whilst the obligations placed on LRFs have increased, local government budgets have been subjected to significant cuts. This has hampered their ability to undertake their statutory duties.**
130. *The Government should ensure the funds allocated to LRFs are appropriate and sufficient to allow them to carry out the full range of their responsibilities. Ring-fenced funding should be allocated to allow LRFs to operationalise the necessary capabilities and standards set out by the Government.*²³²

Community risk registers

131. LRFs make use of the NSRA when preparing their community risk registers. However, it appears that the NSRA is produced without sufficient engagement of LRFs, undermining the validity of the assessments and threatening local preparedness. The Hampshire and Isle of Wight LRF noted that:

“Mostly we have experienced a patchy engagement with the technical risk process—with excessive changes to the risks (like incorporating all the home office risks in one go and completely changing the scoring and the weighting) without consultation and little support to enact it locally, often meaning an excess of work for local risk groups”²³³

228 Institute for Government, How fit were public services for coronavirus? (August 2020) p 31: <https://www.instituteforgovernment.org.uk/sites/default/files/publications/how-fit-public-services-coronavirus.pdf> [accessed 22 November 2021]

229 Q 226 (Stuart Marshall)

230 Q 227 (Dr Fiona Twycross)

231 Q 222 (John Barradell)

232 *Chapter 5 sets out how LRF capabilities and standards of preparation should be benchmarked locally.*

233 Written evidence from Hampshire and Isle of Wight Local Resilience Forum, Hampshire County Council (RSK0070)

132. Witnesses described serious difficulties accessing the NSRA and other information they required to assess risks. Dr Twycross said:

“The use of the National Security Risk Assessment is quite limited, given how restricted access to it is. Clearly, the information in it is very sensitive, but the documentation is not shared in a trusting capacity. It is locked down prohibitively.”²³⁴

Dr Fiona Twycross called for LRFs and their partners to be treated as “trusted partners by government”.²³⁵ Chief Constable Swann said: “It is very difficult to plan if you are not in possession of the information that you need in order to make some planning assumptions and build from that.”²³⁶

133. The format in which the NSRA is provided to LRFs was also criticised. Evidence we received from LRFs noted that information from the NSRA requires to be manually transposed from an online platform into a local risk assessment template before the local risk assessment process can begin.²³⁷ This represents a significant duplication of effort, both in the creation of the templates and the transposing of data. Witnesses also said that the regular changes in methodology and increasing number of risks increases the workload for LRFs.²³⁸ Stuart Marshall suggested that more could be done nationally to prevent this duplication:

“There would be some real benefit in looking at how we get more value out of the national product—a tool or similar for Local Resilience Forums to which we could then apply local knowledge, rather than us having to spend countless hours redeveloping a tool that we know counterparts elsewhere are doing.”²³⁹

Greater engagement and communication, both between LRFs and with the CCS, would allow the creation of a risk assessment product which fits the needs of LRFs and limit unnecessary duplication of effort.

134. **LRFs struggle to access relevant information to inform their risk assessments due to the current high levels of secrecy. This hampers local preparedness. LRFs also face duplicating work performed centrally or by other LRFs due to a lack of communication and coordination between groups, the lack of a single risk assessment template, and the inability to copy and paste information on risks. There is a need to facilitate the sharing of expertise and information across LRFs.**
135. *LRFs should be engaged in the production of the NSRA through the forum described in paragraph 125. The CCS should commit to sharing information as a default with LRFs. Information on the consequences of security threats should be provided at a minimum. Wherever possible, to prevent duplication of effort, information should be produced once at a national level and cascaded down to a*

234 [Q 223](#) (Dr Fiona Twycross)

235 [Q 223](#) (Dr Fiona Twycross)

236 [Q 223](#) (Chief Constable Rachel Swann)

237 Written evidence from Helen Burton (Local Resilience Forum support officer at West Mercia Resilience Forum) ([RSK0078](#)); Written evidence from Thames Valley Local Resilience Forum ([RSK0082](#))

238 [Q 222](#) (Chief Constable Rachel Swann); [Q 223](#) (Stuart Marshall)

239 [Q 223](#) (Stuart Marshall)

local level. The Government should produce a single risk assessment template for use by LRFs to limit the duplication of effort and should ensure that information on risks can be directly copied from the NSRA into the local risk assessment.

The devolved administrations

136. Civil protection, including risk assessment and risk planning, is largely a devolved matter and arrangements differ in each of the devolved nations. In areas of devolved responsibility, the Government of the devolved administration is typically the designated lead on relevant issues. In reserved areas, the UK Government acts as the lead but works in consultation with the relevant administration. A summary of devolved and reserved powers relevant to risk and resilience can be found in Annex 1. Our witnesses from the devolved administrations, however, described the engagement they have with central government as “variable”.²⁴⁰

137. We were told that inconsistent understanding of devolution by those working in central government acts as a barrier to good engagement. Shirley Rogers, Director of Organisational Readiness, Scottish Government, told us that:

“There is a variable degree of understanding about what devolution settlements look like and what devolved Administrations’ powers are ... My observation is partly that there is a tendency to treat us as if we are a department and consult us on the things that people think we will need to know about, rather than the totality.”²⁴¹

Reg Kilpatrick, Director-General of Covid-19 Crisis Co-ordination at the Welsh Government, noted that this experience of partial engagement also extends to ministerial level: “I think our Ministers would say that they were sometimes a bit frustrated that they were invited into those meetings, rather than being there as a partner Government, if you like.”²⁴²

138. Both Reg Kilpatrick and Shirley Rogers called for an agreed set of engagement structures and processes between the UK Government and the devolved administrations at all levels, including ministerial.²⁴³

139. In particular, the NSRA was noted as an area where all three devolved nations would value greater engagement. Both Scotland and Wales use the NSRA in the production of their National Risk Registers.²⁴⁴ Shirley Rogers told us of the importance of early engagement in the risk assessment process to ensure consistency:

“When something is being developed at a UK level, it is really important that there is engagement from Scotland at the earliest possible opportunity, so that, where something requires us to respond in conjunction with something else, we do not find that there are gaps in that two minutes after we need it.”²⁴⁵

This need for greater engagement was echoed by Reg Kilpatrick who said that the Welsh Government needs more engagement in the production of

240 [Q 277](#) (Reg Kilpatrick)

241 [Q 277](#) (Shirley Rogers)

242 [Q 277](#) (Reg Kilpatrick)

243 [Q 277](#) (Reg Kilpatrick); [Q 282](#) (Shirley Rogers)

244 [Q 276](#)

245 [Q 274](#) (Shirley Rogers)

the NSRA, having had little engagement around the 2019 document.²⁴⁶ Reg Kilpatrick also called for greater sight of information in the NSRA, saying:

“However, we would like more information about the national risks. As a devolved Administration, we hold a lot of the levers for responding to incidents and crises. Unless we have that complete information about the nature, scale and detail of the risk, it is quite difficult for us to make sure that our preparedness covers all eventualities.”²⁴⁷

140. **Engagement of the devolved administrations by the UK Government is superficial and ad-hoc and often an afterthought, particularly on reserved matters which may have implications for the resilience systems in the devolved administrations. Resilience is a devolved capability and as a consequence a more formalised engagement process is needed.**
141. *The UK Government needs to produce an agreed set of communications structures at all levels of seniority, including ministerial level, to facilitate effective resilience dialogue between central government and devolved administrations. This must be done in consultation with the devolved administrations. This should define the frequency and terms of engagement, at what stage the devolved administrations should be consulted and/or informed and identify key points of contact.*

Building resilient business and industry

142. Building UK resilience cannot just be an undertaking for the public sector; business and industry also have a critical role to play. While this is particularly true of the UK’s critical national infrastructure operators, many other sectors are vital to the continued smooth operation of the nation. A UK resilience strategy, if it is to be comprehensive, must take note of the role business and industry can play in building resilience and what mechanisms can be used to incentivise more resilient behaviour. Dr Justin Okoli, Senior Lecturer at De Montfort University, in reflecting on lessons from COVID-19, focused on “improving business resilience and making firms better prepared to withstand major disruptions and to thrive amidst turbulence” and recommended that “the UK government finds appropriate ways to create awareness amongst businesses regarding the various resilient-building tools that can enhance their crisis preparation efforts”.²⁴⁸ The Fire Industry Association summarised that “Working together in partnership with the private sector will ensure long term and robust resilience”.²⁴⁹ Leigh Pomlett, President of Logistics UK told us that: “It is incumbent upon us to help the industry with a set of tools it can use that will enable it, going forward, to be more resilient”.²⁵⁰

Insurance

143. Insurance has an important role to play in building resilience, both in helping those affected by events to recover more quickly, and in encouraging policy

246 Q 276 (Reg Kilpatrick)

247 Q 276 (Reg Kilpatrick)

248 Written evidence from Dr Justin Okoli (RSK0061)

249 Written evidence from Fire Industry Association (RSK0029)

250 Q 170 (Leigh Pomlett)

holders to mitigate or avoid the impact of risks.²⁵¹ However, Julian Enoizi, Chief Executive at Pool Re, raised a concern that the link between insurance and the risks outlined in the NSRA is insufficient: “When you look at the Government’s National Risk Register, there is very little, if any, mention of the ability to use insurance to mitigate the risks for which the Government are essentially the insurer of last resort.”²⁵²

144. Julian Enoizi noted the difficulty faced by the insurance industry in managing catastrophic risks. They highlighted the challenges faced in modelling catastrophic risks, and noted that the size and scale of losses incurred can exceed the premiums collected or even the capitalisation of the insurance industry.²⁵³ Professor Paula Jarzabkowski, Professor of Strategic Management at the City University of London, warned that the insurance industry will struggle to cover pandemic risk in the private market, at least in the short term. Professor Jarzabkowski told us: “It will do it in different ways, either through high prices or exclusions that mean there is no meaningful product at an affordable price.”²⁵⁴ Kate Nicholls, CEO, UKHospitality, noted that this was already being seen by the hospitality industry: “as we come out of the Covid crisis, the impact on hospitality and tourism has been so severe that, given the appetite for risk of banks, landlords, insurance companies and utility suppliers, across the board we are having a refusal to supply to hospitality businesses.”²⁵⁵ Professor Jarzabkowski warned that if increasing premiums lead to decreased coverage “we end up with a bigger set of risks that sit on a government balance sheet.”²⁵⁶

145. Our witnesses suggested the need for closer partnerships between the insurance industry and the Government to help address the emerging gap in insurance cover and bolster national resilience. Dr Harwood argued that the Pool Re insurance model should be applied to a wide array of risk scenarios:

“given the success of this current public private model and the strength of the Pool Re culture, it would be logical to maintain existing structural arrangements and extend the remit of this successful company to cover a range of ‘catastrophic shocks’ that may occur in the UK, including for example cyber and pandemics.”²⁵⁷

146. Julian Enoizi also argued for the extension of the re-insurance model to other systemic risks which would help “align social and private sector objectives and integrate the insurance industry firmly into the national resilience and disaster risk-financing architecture”.²⁵⁸ A re-insurance scheme for extreme risks such as a pandemic was also called for by Dr Adam Marshall.²⁵⁹

251 [Q 106](#) (Julian Enoizi)

252 [Q 108](#) (Julian Enoizi)

253 [Q 115](#) (Julian Enoizi)

254 [Q 113](#) (Professor Paula Jarzabkowski)

255 [Q 166](#) (Kate Nicholls)

256 [Q 115](#) (Professor Paula Jarzabkowski)

257 Written evidence from Dr Simon Harwood ([RSK0005](#))

258 Written evidence from Julian Enoizi ([RSK0090](#))

259 Oral evidence taken before the Business, Energy and Industrial Strategy Committee, inquiry on The Impact of Coronavirus on Businesses and Workers, [30 April 2020](#) (Session 2019–21), [Q 90](#) (Dr Adam Marshall)

Box 6: Pool Re

Pool Re is a mutual reinsurance company, established in response to a market failure in the terrorism insurance market. Pool Re is owned by its members who are primarily commercial insurers. The Government have extended an unlimited, but repayable, public financial guarantee to Pool Re. This guarantee ensures that the Government will financially support Pool Re if it ever has insufficient funds to pay a legitimate claim, regardless of the scale of the claim. Pool Re pays a premium to the Government for this guarantee and would repay the money over time if it ever used this facility.

In the event of a loss resulting from an act of terrorism, each member must first pay losses up to a threshold that is determined individually for each insurer. If losses exceed that threshold, the insurer can claim upon Pool Re's reserves. These reserves have been accumulated by the members of Pool Re since its inception. It is only if these reserves are exhausted that Pool Re would draw upon Government support.

Source: Pool Re, 'Reinsurance': <https://www.poolre.co.uk/reinsurance/> [accessed 01 September 2021]

147. **The COVID-19 pandemic has exposed the difficulties posed by the insurance industry in providing affordable cover for catastrophic or systemic risks. Rising premiums will impact insurance coverage and expose the Government to increased risk and damage national resilience. Public-private schemes, such as Pool Reinsurance, have helped to address market failures and distribute risk between the public and private sector.**
148. *The Government should work with the UK insurance industry to explore mechanisms which allow for the transfer, management and mitigation of risks which are too large for the private sector to address alone and for which the Government is the insurer of last resort, but may in fact find itself the insurer of first resort.*

Regulation

149. Regulation is also a mechanism by which the Government can incentivise resilient behaviour in business and industry. The Greater Manchester Combined Authority highlighted the value of effective regulation which they said: "reduces the risk of emergencies occurring, or reduces their impact should they happen" and "provides a means for government to seek assurance that risks are being effectively managed at the local level".²⁶⁰ Professor Hall echoed this, telling us: "We found that the sectors that had tighter regulations and more reporting requirements were making more progress with respect to their adaptation around climate-related risks".²⁶¹
150. Given how interconnected many sectors are, regulation cannot be conducted in siloes. Lindsey Fussell, Group Director for Networks and Communications, Ofcom, noted: "Fundamentally, telecoms depends on power and energy is ever-increasingly dependent on communication."²⁶² Cathryn Scott, Director of Enforcement and Emerging Issues at Ofgem, stressed the importance of cross-regulator working: "As we go into the future, as the system digitises and changes, it will become increasingly important to adopt a whole-system

260 Written evidence from the Greater Manchester Combined Authority (RSK0072)

261 Q 157 (Jim Hall)

262 Q 153 (Lindsey Fussell)

approach and to have more cross-regulatory engagement.”²⁶³ Lindsey Fussell, Cathryn Scott and Professor Collins all noted the importance of the UK Regulators Network (UKRN), a network formed by 13 of the UK’s sectoral regulators.²⁶⁴

151. Near misses²⁶⁵ can reveal weaknesses or vulnerabilities in a system but may go ignored if they do not result in damage or loss. Our witnesses drew attention to the value of acting promptly on near misses. Professor Richardson told us “Near-misses are where we can really learn things”.²⁶⁶ Dame Sue Ion agreed, telling us that an analysis of near misses can help identify systemic issues and implement improvements.²⁶⁷ Cathryn Scott told us that Ofgem have the powers to request information on and explore near-misses, but that operators of essential services²⁶⁸ are not obligated to inform Ofgem of near misses. They told us that Ofgem and the Department for Business, Energy and Industrial Strategy (BEIS) are considering implementing a requirement on operators of essential services to notify Ofgem of near misses.²⁶⁹
152. The UK’s critical national infrastructure is essential for the functioning of the society and economy. Any compromise of critical national infrastructure could lead to the disruption of essential services or threaten national security, leading to a loss of life, casualties, or significant social or economic impact. Lord O’Donnell particularly drew attention to the importance of regulation in ensuring the resilience of the UK’s critical national infrastructure. They suggested that all public or private regulated bodies in the critical infrastructure space should have an audited business continuity plan and that there should be a statutory duty for that plan to be published.²⁷⁰
153. **Regulation is crucial for bolstering national resilience, particularly for the critical national infrastructure sectors. While there is a need to balance resilience with the cost to the consumer, that trade off should not move too far away from resilience. Near-miss reporting is critical to ensure vulnerabilities are caught before they can lead to disaster. Cross regulator working is essential given the cross-sector implications of many risks and this can also help avoid siloes in business and industry. The UK Regulators Network is a valuable development in this regard.**
154. *A statutory duty should be placed on all public and private regulated bodies who operate critical national infrastructure to produce and publish an audited business continuity plan. We encourage Ofgem and BEIS to implement a requirement for the operators of essential services to notify regulators of near misses, with the publication of an annual summary of near miss events.*

263 [Q 153](#) (Cathryn Scott)

264 [Q 153](#) (Cathryn Scott), [Q 237](#) (Cathryn Scott)

265 Near misses are events which have the potential to cause, but do not actually result in, a disruptive event or disaster

266 [Q 138](#) (Professor Stephen Richardson)

267 [Q 138](#) (Dame Sue Ion)

268 Operators of Essential Services are organisations that operate services deemed critical to the economy and wider society. They include critical infrastructure (water, transport, energy) and other important services, such as healthcare and digital infrastructure. Information Commissioner’s Office ‘Key concepts and definitions’: <https://ico.org.uk/for-organisations/the-guide-to-nis/key-concepts-and-definitions/> [accessed 30 November 2021]

269 [Q 154](#) (Cathryn Scott)

270 [Q 261](#) (Lord O’Donnell)

Using the voluntary sector

155. The voluntary sector is another important actor in building UK resilience, with many voluntary bodies having important roles to play in emergency responses. As an illustrative example, St John Ambulance have been a major part of the UK's COVID-19 response. They have provided almost 700,000 hours of support for the NHS, through services such as volunteer ambulance crews, supplying volunteers to hospitals to perform nonhealthcare professional tasks, and undertaking outreach services to homeless and hard-to-reach communities. They have trained 27,500 vaccinators to support the vaccination programme.²⁷¹ Adrian Clee, Emergency Response Lead at The Salvation Army, noted that:

“... the past 16 months have shown that emergency response teams and the rest of the voluntary sector have played an invaluable role and have come together like never before. To be frank, without the extra capacity that the voluntary sector has given, government at local and national level would have really struggled.”²⁷²

The Civil Contingencies Act 2004 and the voluntary sector

156. Our witnesses told us that, particularly at a local level, the valuable contribution of the voluntary sector is not fully appreciated or used. Alistair Read, National Training Officer at Mountain Rescue England and Wales, said: “The challenge is that engaging with the voluntary sector is not a widely endorsed viewpoint, certainly in terms of responders.”²⁷³ Adrian Clee described the engagement as sporadic, and said: “Very often, when a major emergency occurs, the vital role that the voluntary sector can play in welfare and humanitarian support is still very much an afterthought rather than part of well laid-down exercise plans.”²⁷⁴
157. Our witnesses acknowledged that resource constraints impacted the ability of LRFs to engage with the voluntary sector.²⁷⁵ Under the Civil Contingencies Act 2004 (Contingency Planning) Regulations 2005, Category 1 responders must “have regard to the activities of voluntary organisations” in the course of carrying out their emergency and business continuity planning duties.²⁷⁶ We received evidence that this obligation is not sufficient. Adrian Clee said:

“The Civil Contingencies Act mentions that category 1 responders should have regard to the activities of voluntary organisations in carrying out their emergency planning. To be frank, that is pretty lame; it is a throwaway comment with no implied obligation.”²⁷⁷

Mountain Rescue England and Wales questioned how the clause must “have regard” is “tested and compared between different LRFs to provide assurance that a cooperative national response and recovery framework is developed and supported”.²⁷⁸ More generally, the British Red Cross called

271 [Q 229](#) (Richard Lee)

272 [Q 229](#) (Adrian Clee)

273 [Q 228](#) (Alistair Read)

274 [Q 228](#) (Adrian Clee)

275 [Q 229](#) (Adrian Clee); [Q 225](#) (Stuart Marshall)

276 Civil Contingencies Act 2004 (Contingency Planning) Regulations 2005 ([SI 2005/2042](#))

277 [Q 228](#) (Adrian Clee)

278 Written evidence from Mountain Rescue ([RSK0018](#))

for the role of the voluntary and community sector to be strengthened under the Civil Contingencies Act.²⁷⁹

158. **The voluntary sector is a rich source of information and assistance on risk and response at a local level. However, the obligation on Category 1 responders to “have regard to the activities of voluntary organisations” is unclear and interpretations vary between LRFs.**
159. *The Government should clarify what “have regard to the activities of voluntary organisations” means and outline what best practice in voluntary sector engagement would look like through the production of improved guidance for LRFs.*

A volunteer reservist cadre

160. The Integrated Review of Security, Defence, Development and Foreign Policy states that the Government will consider the establishment of a “civilian reservist cadre for support in times of crisis”.²⁸⁰ A reservist cadre was recommended to us by several witnesses, as a means for trained members of the public to support emergency responses.²⁸¹
161. However, in evidence to us the then Paymaster General and Roger Hargreaves described a much smaller body. They outlined a force of approximately 1,000 people, predominantly retirees with skills in emergency planning and response. They noted that this would reduce dependency on military planners or government liaison officers who are often called on to support local responses.²⁸²
162. We put the proposed reservist cadre, as it was outlined in the Integrated Review, to voluntary sector leaders to ascertain their views. They roundly rejected the idea that a new reservist force should be created from scratch. They urged that the existing voluntary sector should form the basis of any reservist force, with better central government coordination and facilitation. Adrian Clee said:

“Use the strength of the voluntary sector in those areas where it is established, trusted and rooted in those communities, and encourage people to volunteer for them. The creation of such a reserve could be an extremely damaging thing to those local community groups.”²⁸³
163. Richard Lee, Chief Operating Officer at St John Ambulance, echoed this, saying:

“St John Ambulance feels strongly that the answer here is a cadre of volunteers, not as a stand-alone, but as a knitted-together model of existing organisations with existing capabilities, each being given a role

279 Written evidence from British Red Cross ([RSK0077](#))

280 Cabinet Office, *Global Britain in a Competitive Age: the Integrated Review of Security, Defence, Development and Foreign Policy*, CP 403 (March 2021) p 88: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/975077/Global_Britain_in_a_Competitive_Age- the_Integrated_Review_of_Security_Defence_Development_and_Foreign_Policy.pdf

281 [Q 91](#) (Dr Simon Harwood); Written evidence from Dr Simon Webster ([RSK0014](#)); Written evidence from SRSRM Ltd ([RSK0054](#)); Written evidence from Resilience First ([RSK0015](#)); Written evidence from Devon, Cornwall and Isles of Scilly LRF ([RSK0036](#)); Written evidence from Mountain Rescue England and Wales ([RSK0018](#))

282 [Q 272](#) (Penny Mordaunt MP)

283 [Q 231](#) (Adrian Clee)

within that cadre so that it would be funded, prepared, exercised, tested and equipped to deliver across the country when required.”²⁸⁴

164. Alistair Read also agreed, noting that anything established from scratch would be unlikely to be superior to existing voluntary forces:

“... the impact might be better if the development of a volunteer civilian reservist cadre was focused on already established volunteer organisations. They have established links; they have interoperability; they have communication systems. Everything else that may have been suggested within the integrated review adds an extra layer of newness to it. That would bring additional challenges. A huge amount of our resilience-type work relies on local knowledge and connections, which take a long time to establish.”²⁸⁵

165. Representatives of the Ministry of Defence were cautious about these proposals. Paul Wyatt, Director of National Security in the Ministry of Defence, contrasted the proposed cadre with the current military reserves saying:

“I worry that an additional generic resilience capability would not necessarily be the way to go. It is very important to have good resilience plans and capabilities, but something that looked a bit like us, in terms of being enthusiastic but not knowledgeable, might not necessarily add value.”²⁸⁶

Major General Charles Stickland, Assistant Chief of the Defence Staff (Operations and Commitments) at the Ministry of Defence, also cautioned that: “You have to think very carefully about its design and what it is for. From a perspective of essentially having things at readiness, the idea of people sitting about without a specific function does not sit well.”²⁸⁷

166. Richard Lee highlighted that an important first step towards better utilisation of the voluntary sector is mapping the existing capability: “... we simply do not have a map of the capabilities of the third sector across the country. We do not know locally what is available everywhere.”²⁸⁸ There already exist initiatives aimed at coordinating the voluntary sector, including the Voluntary and Community Sector Emergencies Partnership (VCSEP). Adrian Clee praised the VCSEP as having “made a real difference to partnership working and coordination for the voluntary sector and across the country”.²⁸⁹ Adrian Clee said that “as we move out of the pandemic it is vital for the Government to continue to engage actively with that partnership, provide funding to keep it going”.²⁹⁰

284 [Q 231](#) (Richard Lee)

285 [Q 231](#) (Alistair Read)

286 [Q 191](#) (Paul Wyatt)

287 [Q 191](#) (Major General Charles Stickland)

288 [Q 228](#) (Richard Lee)

289 [Q 229](#) (Adrian Clee)

290 [Q 230](#) (Adrian Clee)

Box 7: The Voluntary and Community Sector Emergencies Partnership

The Voluntary and Community Sector Emergencies Partnership (VCSEP) is a government-backed coalition of over 250 national and local voluntary and community sector organisations. It was formed in response to learnings from several 2017 national crises. The VCSEP advocates increased collaboration between government and the voluntary and community sector in an emergency. It aims to improve responses to major emergencies by pooling resources and intelligence.

Source: Written evidence from British Red Cross ([RSK0077](#))

167. Our witnesses noted that sometimes volunteers can have existing commitments which mean they are not able to respond to sudden emergencies.²⁹¹ They welcomed any initiatives which would allow volunteers to respond at shorter notice, including leave or pay schemes modelled on the army reserves.²⁹²
168. Education is an important element of building the population's resilience skills. Professor Brooke Rogers told us about the value of educating "schools and communities so that they have the fundamentals to deal with any risk or uncertainty and know that uncertainties can exist and how they should manage those".²⁹³ Stuart Marshall noted the need to develop and tap into skills in the population which build resilience, particularly highlighting the value of first aid lessons in schools.²⁹⁴
169. ***The proposed reservist cadre lacks ambition and is not in line with the views of the voluntary sector. The voluntary sector should be supported to organise existing voluntary forces into a response mechanism. The Government should map existing voluntary capability and use this as the basis of any response. There should be a central coordinating point for a national voluntary response, mapping capability regularly, directing volunteers to under resourced voluntary forces and facilitating better liaison amongst voluntary groups and between the sector and the Government. The Government should be prepared to pay volunteers for days of work missed through participation in any coordinated response to risk events. The Government should consider adding emergency response skills to the post-16 curriculum, with schools and further education colleges providing volunteering opportunities to students.***

The use of volunteers internationally

170. We received significant evidence on the ways in which volunteers are utilised in emergency planning and response internationally. These countries were flagged to us as examples of best practice which could be studied and borrowed to inform UK policy.
171. Professor Alexander Fekete, Professor of Risk and Crisis Management at the Technical University of Cologne, discussed the success of the German scheme Technisches Hilfswerk (THW). The THW is a civil protection organisation controlled by the German federal government. 99% of its approximately 80,000 members are volunteers. One of their duties is to

291 [Q 233](#)

292 [Q 233](#)

293 [Q 209](#) (Professor Brooke Rogers)

294 [Q 225](#) (Stuart Marshall)

provide technical relief in Germany as part of national civil protection measures.²⁹⁵ Professor Fekete said that: “The success story is their technical equipment and their highly skilled staff—they get training—and their long-standing good reputation.”²⁹⁶ They said that the THW chapters act like a local identity group and help build community resilience.²⁹⁷

172. The Swedish approach to emergency preparedness emphasises the contributions of volunteers as part of its whole of society approach to security and defence. In Sweden, there are 18 voluntary defence organisations tasked with recruiting and training volunteers in different fields including as logistics, transport, staff support, communications, animal disease control, and aviation. Jim Kronhamn said: “We find that volunteer engagement strengthens the resilience of the individual and contributes to building popular support as well for contingency policy.”²⁹⁸ They noted that an important element of the Swedish approach was ensuring their volunteer forces were diverse and that different types of volunteers are given suitable tasks and responsibilities.²⁹⁹
173. In the Netherlands, regional water authorities use dike armies to support the safety and security of Dutch anti-flooding infrastructure. Harold van Waveren, Chair, National Crisis Team for Flood Risk, at the Rijkswaterstaat, also noted the improved community resilience and flood awareness borne by volunteering as part of the dike armies. However, they provided two points to consider. The first was providing adequate training to ensure the safety of volunteers. The second was that volunteers may not always be available, particularly during extreme events, and that this should be accounted for in emergency plans.³⁰⁰
174. Simon Webster promoted the Australian model of local volunteering, the State Emergency Service. Simon Webster said: “Australian states have an immediately available body of local volunteers (State Emergency Service) to take responsibility when disaster strikes (or is threatened) and to support the full-time emergency services”.³⁰¹ SRSRM Ltd, a resilience advice company, also noted the State Emergency Service as an example to be emulated.³⁰²

Mobilising the public

175. The materialisation of many of the most serious risks facing the UK would have significant impacts on members of the public and require them to undertake extraordinary measures to ensure their own safety and the safety of others. However, in spite of this, the UK population are not widely engaged in building resilience and planning for risks.
176. Professor Duncan Shaw, Professor of Operational Research and Critical Systems at the University of Manchester, said that: “we need to take a strategic approach to supporting communities, to supporting the public to prepare for and respond to emergencies, given that the public are usually the first to

295 Bundesanstalt Technisches Hilfswerk, ‘The THW’: https://www.thw.de/DE/THW/thw_node.html [accessed 15 April 2021]

296 Q 198 (Professor Alexander Fekete)

297 Q 198 (Professor Alexander Fekete)

298 Q 198 (Jim Kronhamn)

299 Q 198 (Jim Kronhamn)

300 Q 199 (Harold van Waveren)

301 Written evidence from Dr Simon Webster (RSK0014)

302 Written evidence from SRSRM Ltd (RSK0054)

arrive at and the last to leave a disaster.”³⁰³ Roger Hargreaves agreed that “for most emergencies, the interaction between the authorities and the public, and the behaviour of the public, are key determining factors in the success of any response”.³⁰⁴ However, there is very little public communication on the topic of risk or emergency response. Roger Hargreaves said that there was a “chequered history” of public engagement in the UK and that the question of how best to engage the public in risk and resilience remained “an open policy question”.³⁰⁵

177. Elisabeth Braw, Visiting Fellow at the American Enterprise Institute, told us that: “We are lacking any skill among the wider population ... the whole population is essentially a lost opportunity, because nobody, apart from the people who have skills as part of their professional career, really knows what to do.”³⁰⁶ Professor Shaw warned that, “We cannot have a passive public who are waiting for everybody to come to save them.”³⁰⁷
178. By contrast, other countries more actively engage their populations in the resilience effort. In Sweden, for example, the public are viewed as one of the elements of the nation’s ‘total defence’ structure. Information is actively provided, and the public are encouraged to be prepared. Jim Kronhamn said: “We do not want people to be concerned, but it is important that you are aware of what can happen, how it can affect you and what you can do to affect your own safety and preparedness of the people close to you.”³⁰⁸
179. Another example highlighted to us is Finland’s national defence courses. These aim to “provide civilian or military persons in a leading position with a total overview of Finland’s foreign, security and defence policy, improve collaboration between different sectors of society in emergency conditions and promote networking between people working in different areas of comprehensive security”.³⁰⁹ Elisabeth Braw described it as “a fantastic way of building cohesion within the leadership of any country”³¹⁰
180. During the COVID-19 pandemic the population has shown itself to be willing, even eager, to ‘step-up’ to the challenge of risk response. Professor Shaw described the last year as a “masterclass” in communities supporting each other, managing their own preparedness and needs.³¹¹ Roger Hargreaves said that “this vast exercise in national response to the COVID crisis has hugely relied upon the actions of the public”.³¹² This effort should not be wasted, and this public capability must be encouraged and built on so that it is available in good times and in bad.
181. In order to improve public preparedness and bolster national resilience, the public should be supported with the information they need in an effective format. Professor Duncan Shaw, Dr Jennifer Bealt and David Powell noted that: “Encouraging preparedness at individual and organisational levels

303 [Q 211](#) (Professor Duncan Shaw)

304 [Q 11](#) (Roger Hargreaves)

305 [Q 09](#) (Roger Hargreaves)

306 [Q 156](#) (Elisabeth Braw)

307 [Q 211](#) (Professor Duncan Shaw)

308 [Q 197](#) (Jim Kronhamn)

309 Turvallisuukskomitea, ‘National Defence Courses’: <https://turvallisuukskomitea.fi/en/cooperation/national-defence-courses/> [accessed 22 November 2021]

310 [Q 157](#) (Elisabeth Braw)

311 [Q 211](#) (Professor Duncan Shaw)

312 [Q 11](#) (Roger Hargreaves)

reduces the pressures on local responders and authorities, and balances out the responsibilities of risk planning between local government, their partners and individual members of the public”.³¹³ Previous attempts have been made to share information on preparedness with the public, including the National Risk Register (NRR) and the 2004 ‘Preparing for emergencies: What you need to know’ booklet.³¹⁴

182. A more considered and consistent approach to communication is needed. Our witnesses set out what information should be provided and how. Sir David Spiegelhalter said: “You have to tell people what you know, what you do not know and what you are doing about it, what people can do, what the public can do, and then you emphasise that you will come back to them and things will change.”³¹⁵ Professor Rogers also stressed the need to “provide credible rationale for the guidance itself and the subsequent changes”.³¹⁶ The Royal Society said that: “ensuring that decisions, and the evidence that underpin them, are transparent is key to earning public support for steps to build resilience, many of which may compete against other priorities.”³¹⁷ Professor Fekete noted that there is no evidence that providing the public with information on risk and resilience leads to panic amongst the population.³¹⁸
183. Misinformation poses a threat to societal resilience and could disrupt an emergency response. Our witnesses noted that a benefit of active communication is the improved ability to counteract misinformation. Sir David Spiegelhalter stressed the value of taking note of misinformation and pre-empting it early: “There is a huge need to pre-empt misinformation, to get in there first and to realise what is going on, to listen to what is circulating.”³¹⁹
184. An example of best practice in encouraging preparedness is the Swedish booklet (also available in English) entitled ‘Om krisen eller kriget kommer’ (If crisis or war comes)”. It provides citizens with information about building personal preparedness and responding to crises. It prompts citizens to consider how they would be able to cope in a situation where society’s services were not working as normal, or what risks might affect them and their local area. It contains a brief guide to countering false information, how to respond in the event of a terror attack, and a guide to emergency warning signals. It also includes a checklist for home preparedness.³²⁰ Jim Kronhamn told us the brochure had been a success, being well received and the information within remembered by recipients.³²¹
185. It is important to encourage the public to increase their preparedness and play a more active role in emergency responses. This must come with the recognition that not all individuals have the same capacity to be resilient. Linda

313 Written evidence from Professor Duncan Shaw, Dr Jennifer Bealt and David Powell, The University of Manchester ([RSK0068](#))

314 ‘Terror advice pamphlet unveiled’, *BBC News* (26 July 2004): http://news.bbc.co.uk/1/hi/uk_politics/3923949.stm [accessed 22 November 2021]

315 [Q 208](#) (Professor Sir David Spiegelhalter)

316 [Q 208](#) (Professor Brooke Rogers)

317 Written evidence from the Royal Society ([RSK0094](#))

318 [Q 197](#) (Alexander Fekete)

319 [Q 209](#) (Professor Sir David Spiegelhalter)

320 Swedish Civil Contingencies Agency, *If Crisis or War Comes* (May 2018): <https://www.dinsakerhet.se/siteassets/dinsakerhet.se/broschyren-om-krisen-eller-kriget-kommer/om-krisen-eller-kriget-kommer---engelska-2.pdf> [accessed 30 November 2021]

321 [Q 197](#) (Jim Kronhamn)

Battarbee, Director of Operations at the Trussell Trust, said: “Although it is the same storm, we are in very different boats.”³²² Matthew Gah-Kai Leung, PHD student at the University of Warwick, said that vulnerable groups may not have the same ability to weather a disaster. Matthew Gah-Kai Leung recommended that preparedness measures should target a wide array of communities to attend to their needs and that response policy must be fine-tuned to address problems specific to these groups. Leung said that “this will ensure that vulnerable groups do not suffer disproportionate burdens as a result of the catastrophe”.³²³

186. **The UK population is not sufficiently encouraged to engage in emergency planning or build a level of personal preparedness. At present, the NRR is the primary tool for public education employed by the Government. This approach falls short and does not empower the public to make informed decisions about personal safety. There is little evidence to suggest that providing information leads to panic. Providing individuals with knowledge about how to respond in a crisis and guidance to help build personal preparedness will improve societal resilience. It should be recognised that socio-economic disparities threaten to undermine civilian resilience capability. Moreover, misinformation poses a direct risk to civil cohesion and resilience. This risk has been exacerbated by the growing influence of social media platforms. Misinformation should be identified, pre-empted and countered as early as possible.**
187. *The Government should commit to a biennial publication of a brochure on risk preparedness. This brochure should educate the public on general resilience principles, outline how individuals could improve their preparedness, provide guidance on what to do in an emergency, and signpost further information on resilience. This should be modelled on the Swedish brochure ‘If crisis or war comes’ and supplement the NRR.*
188. *The Government should consider the organisation and provision of a residential, intensive course on national security, resilience and defence for rising leaders in the public and private sectors. The Government should lay a written statement on with the findings of its consideration in both Houses within 6 months of publication of this report.*

322 [Q 229](#) (Linda Battarbee)

323 Written evidence from Matthew Gah-Kai Leung ([RSK0069](#))

Box 8: COVID-19 Case Study

Our inquiry would not be complete without acknowledging the consequences that the COVID-19 pandemic has wrought on the UK. It was against the backdrop of the pandemic that the Liaison Committee recommended the appointment of this Committee to investigate the UK's risk assessment and risk planning system.³²⁴ This investigation has never been an inquiry into the Government's handling of COVID-19, but the pandemic has highlighted gaps in our risk management system. A pandemic, like any extreme risk, will challenge many of the interconnected linkages that make up our society. This case study illustrates that extreme risks must be mitigated through the whole of society approach outlined in the previous chapter.

The pandemic

The COVID-19 pandemic is a global pandemic caused by the SARS-CoV-2 virus. The virus was first identified in December 2019 in Wuhan, Hubei Province, China. The World Health Organisation (WHO) declared a Public Health Emergency of International Concern on 30 January 2020, and later declared a pandemic on 11 March 2020.³²⁵ The first cases of COVID-19 in the UK were confirmed on 31 January 2020.³²⁶ The UK entered a nationwide lockdown on 23 March 2020. This initial lockdown ended in June, but the UK entered a second lockdown between 5 November 2020 and 2 December 2020. On 4 January 2021, the UK entered a third lockdown which was gradually eased from March 2021.³²⁷

After the first wave of the pandemic, the UK had the highest cumulative excess mortality rate in Europe.³²⁸ As of 18 November 2021, 166,730 deaths had been recorded with COVID-19 listed as the cause of death.³²⁹

UK pandemic preparedness

A pandemic was a foreseeable risk, one the Government was aware of and had taken steps to address. The Government had categorised pandemic influenza as a highest priority 'tier-1' risk in the National Security Risk Assessment (NSRA) since 2010. In 2018, the Government said: "One or more major hazards can be expected to materialise in the UK in every five-year period. The most serious are pandemic influenza, national blackout and severe flooding."³³⁰

324 Liaison Committee (Lords), *New special inquiry committees 2020–21* (Second Report, Session 2019–21, HL Paper 102)

325 World Health Organisation, 'Listings of WHO's response to COVID-19': <https://www.who.int/news/item/29-06-2020-covidtimeline> [accessed 22 November 2021]

326 Department of Health and Social Care, 'CMO confirms cases of coronavirus in England': <https://www.gov.uk/government/news/cmo-confirms-cases-of-coronavirus-in-england> [accessed 22 November 2021]

327 Institute for Government, *Timeline of UK coronavirus lockdowns*: <https://www.instituteforgovernment.org.uk/sites/default/files/timeline-lockdown-web.pdf> [accessed 30 November 2021]

328 Office for National Statistics, *Comparisons of all-cause mortality between European countries and regions* (19 March 2021) p 5: <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/articles/comparisonsofallcausemortalitybetweeneuropeancountriesandregions/2020> [accessed 30 November 2021]

329 HM Government, 'Coronavirus (COVID-19) in the UK': <https://coronavirus.data.gov.uk/details/deaths> [accessed 22 November 2021]

330 Cabinet Office, *National Security Capability Review* (March 2018), para 9: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/705347/6.4391_CO_National-Security-Review_web.pdf [accessed 30 November 2021]

In response to the high likelihood of pandemic threat, the UK put in place pandemic mitigation practices. In the 2019 Global Health Security Index the UK was ranked second internationally for health security capabilities.³³¹ In 2018 the UK developed and published its Biological Security Strategy which provided a framework for understanding, preventing, detecting and responding to biological risks. The strategy is 48 pages long, with one page devoted to implementation. Dr Opi Outhwaite said, by the start of the COVID-19 pandemic in 2019, “very little” implementation of the strategy had taken place.³³²

In the 2017 National Risk Register (NRR), pandemic influenza and emerging infectious diseases were rated four out of five for likelihood of occurrence in the next five years. It was estimated that pandemic influenza would have a more severe impact than emerging infectious disease. Pandemic flu was assigned an impact threshold of up to 50% of the UK population experiencing symptoms, which had the potential to cause between 20,000 and 750,000 fatalities. Emerging infectious diseases, such as novel coronaviruses, were assigned an impact threshold of “several thousand people experiencing symptoms” with the potential for “up to 100 fatalities”.³³³

In 2016 the Government conducted Exercise Cygnus to simulate a pandemic event. This was a major exercise to explore the impact of an influenza pandemic on the UK. The exercise focused mainly on the healthcare impacts of a pandemic. It involved ministers and officials from central and local government, NHS organisations, prisons and local emergency response planners. Part of the report’s conclusions were that: “the UK’s preparedness and response, in terms of its plans, policies and capability, is currently not sufficient to cope with the extreme demands of a severe pandemic that will have a nation-wide impact across all sectors.”³³⁴ Dr Karen Reddin, Senior Lecturer in Disaster Management at Bournemouth University, a participant in Exercise Cygnus, said that due to the competing government priorities of the EU referendum and Brexit, there was a “lack of will” to implement the lessons of the exercise.³³⁵ Dr Reddin said that this may have contributed to the subsequent problems such as shortages in hospital surge capacity and the lack of coordination between the health and social care sectors.³³⁶

331 GHS Index, *Global Health Security Index* (October 2019) p 20: <https://www.ghsindex.org/wp-content/uploads/2019/10/2019-Global-Health-Security-Index.pdf> [accessed 30 November 2021]

332 Q 92 (Dr Opi Outhwaite)

333 Cabinet Office, *National Risk Register of Civil Emergencies* (September 2017) p 34: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/644968/UK_National_Risk_Register_2017.pdf [accessed 30 November 2021]

334 Public Health England, *Exercise Cygnus Report* (November 2020) p 6: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/927770/exercise-cygnus-report.pdf [accessed 30 November 2021]

335 Q 181 (Dr Karen Reddin)

336 Q 181 (Dr Karen Reddin)

Another exercise, Exercise Alice, held in 2016, imagined a large scale outbreak of the coronavirus MERS-CoV (Middle East respiratory syndrome). It was designed to “explore existing arrangements and to scrutinise the challenges presented by a large scale MERS-CoV outbreak in the UK.”³³⁷ Many of the lessons identified have relevance to the UK’s experience of COVID-19. The lessons identified included “quarantine versus self-isolation and the clarity required about the options; PPE level and the need for instruction on use; community sampling planning and effective proportional communications to both front line staff and consistent public messaging.”³³⁸

Inquiries into the handling of COVID-19

The House of Commons Health and Social Care and Science and Technology Committees have performed an in-depth analysis of the lessons that can be learned from the COVID-19 pandemic to date. We draw attention to their findings with particular support for their recommendations relating to the UK’s risk management landscape. This includes a recommendation that the resourcing and capabilities of the Civil Contingencies Secretariat should be improved to ensure that Departments have their risk plans stress tested.³³⁹ We also draw attention to the National Audit Office report titled ‘The government’s preparedness for the COVID-19 pandemic: lessons for government on risk management’. It concluded that there had been: a failure to plan for many non-health consequences of the pandemic; a failure to learn lessons from exercises; limited oversight and assurance of plans; a variation in capacity, capability and maturity of risk management across government departments; a need to strengthen the end-to-end risk management process to ensure that it addresses all significant risks, including interdependent and systemic risks; a need for greater collaboration within and outside of Government; a need to define a risk appetite; and a need to strengthen national resilience.³⁴⁰

The UK’s Assessment of COVID-19

Prior to the emergence of COVID-19, the UK had a high degree of confidence in its assessment of, and preparedness for, a pandemic. Roger Hargreaves said that the UK found itself “very well prepared for pandemic flu and being very highly regarded internationally for our preparedness.”³⁴¹ Much of the Government’s preparedness efforts were singularly focused on pandemic influenza. As Roger Hargreaves said, “pandemic flu was the risk on which there was absolute consensus: this was the manifestation of a pandemic.”³⁴²

337 Public Health England, *Report - Exercise Alice Middle East Respiratory Syndrome 15 Feb 2016* (October 2021) p 8: <https://www.documentcloud.org/documents/21080373-report-exercise-alice-middle-east-respiratory-syndrome-15-feb-2016> [accessed 30 November 2021]

338 Public Health England, *Report - Exercise Alice Middle East Respiratory Syndrome 15 Feb 2016* (October 2021) p 15: <https://www.documentcloud.org/documents/21080373-report-exercise-alice-middle-east-respiratory-syndrome-15-feb-2016> [accessed 30 November 2021]

339 House of Commons Health and Social Care and Science and Technology Committee, *Coronavirus: lessons learned to date* (6th Report of the Health and Social Care Committee and 3rd Report of the Science and Technology Committee, Session 2021–22. HC 92)

340 C&AG’s report, *The government’s preparedness for the COVID-19 pandemic: lessons for government on risk management*, Session 2021–22, HC 735, 19 November 2021, p 10

341 [Q 10](#) (Roger Hargreaves)

342 [Q 10](#) (Roger Hargreaves)

Our witnesses criticised this narrow focus on pandemic influenza and the Government's confidence in its preparedness. Sir Oliver Letwin said: "Part of the problem about Covid is that we had monomaniacal attention on pandemic flu."³⁴³ Dr Piers Millett said that senior policymakers within Government met the idea that a disease event could still happen that would lead to tens of millions of cases and millions of dead with "incredulity".³⁴⁴

The UK response to COVID-19

It will be for future inquiries to undertake a comprehensive account of the pandemic and judge how successful the Government was in protecting this country from the virus. This section outlines three areas that our witnesses identified as shortcomings in the Government's response to the virus: the machinery of government, external involvement and capabilities and powers.

The machinery of government and COVID-19

Witnesses described a machinery of government as a system which could not handle the scale of challenge posed by the pandemic. Pandemics are not solely health emergencies, and the response to COVID-19 impacted every government department. However, in advance of the pandemic, many departments had done little specific planning for such an emergency.³⁴⁵ According to Charlotte Pickles, the Government's use of the Lead Government Department model exposed the UK system to "a severe level of under planning" and that:

"while there were fundamental flaws in the planning of the Lead Government Department for the pandemic—that is, the Department of Health and Social Care—there was almost no planning in some other government departments for risks that were well anticipated in the event of a pandemic".³⁴⁶

This failure to create holistic policy also extended to the pandemic response. Alex Thomas, Programme Director at the Institute for Government, described the weaknesses of the Government's decision-making structures during the pandemic. Alex Thomas noted that in the initial stages of the pandemic, the Cabinet Office lacked the strength to coordinate a cross-Government response: "There was not a strong enough unit in the middle of the Cabinet Office that could draw all this stuff together and serve up decisions for senior Ministers and the Prime Minister to make."³⁴⁷

External input

Alex Thomas also described a tendency for Government to "retrench and go back into the bowels of 70 Whitehall or Downing Street" and make decisions without adequate external input. Alex Thomas noted that decision-making during the pandemic was most effective when departments reached out to local government and the people most affected by policy decisions.³⁴⁸ This is consistent with the culture of secrecy described in Chapter 3.

343 [Q 258](#) (Sir Oliver Letwin)

344 [Q 16](#) (Dr Piers Millett)

345 [Q 214](#) (Charlotte Pickles)

346 [Q 214](#) (Charlotte Pickles)

347 [Q 214](#) (Alex Thomas)

348 [Q 214](#) (Alex Thomas)

Chief Constable Rachel Swann said that there was a lack of support offered during the early stages of the pandemic. Chief Constable Swann considered that Government Liaison Officers were spread too thinly across the country and that this had led to “a real absence of consistency and of information going both ways”.³⁴⁹

Capabilities and powers

Witnesses also noted the absence of specific capabilities which impacted the UK’s pandemic response. The military has played a crucial role in the UK’s response to COVID-19, providing valuable skills through the Military Aid to the Civil Authority system. However, the armed forces cannot also act as a civil protection force. Paul Wyatt observed that further Government dependency on the military for enhancing resilience is not an option. Paul Wyatt said that risk management systems must be on “the right side of the line between resilience and reliance”.³⁵⁰ Witnesses said that during COVID-19 and other emergencies, the UK has been fortunate that defence forces have been able to meet their need for logistical support and other forms of military aid.³⁵¹

The ability to test for the virus, to track its progress and isolate infected individuals has been a crucial element of the global pandemic response. Dr Cassidy Nelson said that one of the “disappointing features” of the Government’s early pandemic response was a lack of testing capacity for the virus.³⁵² Dr Nelson argued that the necessity of community testing should have been foreseen, and that a failure to partner with more private laboratories or expand Government testing capability led to the cessation of community testing in March 2020.³⁵³

Response to risks is increasingly reliant on rapidly accessible data to help inform policymaking, but barriers to data access and sharing have hampered the COVID-19 response.³⁵⁴ Roger Hargreaves acknowledged that the pandemic response has shown that “Some of our systems for recording information are some way away from real time”.³⁵⁵ Sir Patrick Vallance said that at the start of the pandemic “we had enormous difficulty in getting the data required in order to understand exactly what was going on.”³⁵⁶

349 [Q 224](#) (Chief Constable Rachel Swann)

350 [Q 189](#) (Paul Wyatt)

351 [Q 120](#) (Dr Marc Schelhase); [Q 189](#) (Paul Wyatt); [Q 120](#) (Sir Chris Deverell)

352 [Q 96](#) (Dr Cassidy Nelson)

353 [Q 94](#) (Dr Cassidy Nelson)

354 House of Commons Science and Technology Committee, *The UK response to covid-19: use of scientific advice* (1st Report of Session 2019–21. HC 136)

355 [Q 10](#) (Roger Hargreaves)

356 [Q 289](#) (Sir Patrick Vallance)

As COVID-19 emerged and then spread to the UK, the UK Government opted to manage the pandemic using both existing and new legislation. Legislative power was provided by the Public Health Act (Control of Disease Act) 1984³⁵⁷ and the Coronavirus Act 2020.³⁵⁸ The Government opted not to use United Kingdom-wide emergency powers under the Civil Contingencies Act 2004. An analysis of the reasons given for this choice and an assessment of the impact of these legislative choices on co-ordination of the response to the COVID-19 pandemic across the UK can be found in the report by the Constitution Committee on COVID-19 and the use and scrutiny of emergency powers.³⁵⁹ We draw attention to the conclusions and recommendations drawn by the Constitution Committee. In particular, we support the recommendation that the Government should review the use of emergency powers, and the scrutiny of these powers by Parliament, in advance of any public inquiry into the COVID-19 pandemic.³⁶⁰

Lessons learned from the COVID-19 case study

189. Many of our conclusions and recommendations apply to COVID-19 as well as other disruptive events. We wish to draw attention to two specific areas. The first is the failure to implement fully the lessons learned from Exercise Cygnus in 2016 and the second is the need for a renewed commitment to the Biological Security Strategy.
190. Exercise Cygnus should have been a unique opportunity to address known shortcomings in the UK system. Many of the lessons identified during Exercise Cygnus have come to bear during COVID-19. We had not implemented central lessons from the exercise before the start of the pandemic and as Professor Hall noted: “We have been looking back wistfully at Exercise Cygnus during this epidemic.”³⁶¹ This suggests that criticism of the UK’s response to the pandemic cannot fairly be attributed to hindsight.
191. **In particular, Exercise Cygnus recommended the production of a “Pandemic Concept of Operations” to assist with operationalising the response to a pandemic by clarifying the role of organisations and the rules of engagement. Based on the evidence we have received about the decision making in Government at the outset of the pandemic, it appears that this was not properly implemented prior to the COVID-19 pandemic. During the early stages of COVID-19 there was significant confusion in decision-making which hampered the UK’s response.**
192. *A Pandemic Concept of Operations should be produced, as well as Concepts of Operations for other major risks, to ensure that the confusion surrounding governance does not arise in future crises.*
193. The Biological Security Strategy provided a framework for understanding, preventing, detecting and responding to biological risks. Dr Piers Millett

357 [Public Health \(Control of Disease\) Act 1984](#)

358 [Coronavirus Act 2020](#)

359 Constitution Committee, [COVID-19 and the use and scrutiny of emergency powers](#) (3rd Report, Session 2021–22, HL Paper 15)

360 Constitution Committee, [COVID-19 and the use and scrutiny of emergency powers](#) (3rd Report, Session 2021–22, HL Paper 15)

361 [Q 157](#) (Professor Jim Hall)

told us that: “Implementing the existing national biosecurity strategy would go a long way to addressing the current gaps.”³⁶²

194. **The 2018 Biological Security Strategy was a welcome development but the Government’s failure to implement it fully has rendered it ineffectual. The emergence of COVID-19 has demonstrated the importance of strengthening the UK’s biological security.**
195. *The Biological Security Strategy needs to be renewed, refreshed and implemented, whilst also incorporating the lessons learned from COVID-19. At present, the non-implementation of the Strategy represents a significant gap in UK preparedness and should be rectified as a priority. The updated strategy should be published alongside an implementation plan so that its progress can be tracked. Time in both Houses should be devoted to a debate on the refreshed strategy.*

362 [Q 16](#) (Dr Piers Millett)

CHAPTER 5: RISK ASSESSMENT

196. Risk assessment is both a process and a product. As a process, it entails identifying and analysing potential events which may cause harm. As a product, it is typically a register of the most serious risks facing an organisation. Within Government, risk assessment is the responsibility of every Government department and is overseen by the Civil Contingencies Secretariat (CCS). There are two outputs of the Government's risk assessment process - the National Security Risk Assessment (NSRA), an internal document for use by planners and decision makers; and the National Risk Register (NRR), a more high-level document aimed at the general public.
197. According to Roger Hargreaves: "the NSRA is the basis for all of the contingencies work in government: it is the starting point for all our preparedness activity."³⁶³ In this chapter we will focus on the NSRA and discuss the process of risk assessment at five levels: central government; Local Resilience Forums (LRFs); business and industry; the voluntary sector; and the general public. It will focus primarily on the NSRA methodology and the current approach to consultation at all levels.
198. We were able to view the Official-Sensitive version of the NSRA in June 2021. This report, however, is based on the evidence we have received during our inquiry rather than our personal reflections on the content of the NSRA.

The National Security Risk Assessment

199. We wish to clarify that we are of the belief that the NSRA should continue to be produced by the CCS, with inputs from individual departments.

Timeframes and the velocity of risk

200. The NSRA currently assesses risks on a two-year timeframe. This approach was justified by Roger Hargreaves who said: "The shorter the timeframe, the more nuanced a story we can construct about the risk. On longer timeframes, we have a greater degree of uncertainty about the direction the risk takes."³⁶⁴
201. Risks which emerge over a longer timeframe or risks which have a low likelihood of occurring within the next two years are not properly accounted for by the current assessment timeframe of the NSRA. The short-term approach taken was criticised by Lord Harris who told us that one of the problems with the NSRA "is that it focuses on the next two to five years—things that are immediately foreseeable—so it misses out some of the long-term issues that come forward."³⁶⁵ Dr Fearnley, also criticised the two-year timeframe of the NSRA, saying: "The National Risk Register has a two-year time-frame so we are not seeing a number of different hazards that we need to prepare for."³⁶⁶ Sir Patrick Vallance summarised that: "If you take a two-year outlook, you get the wrong answer."³⁶⁷
202. Witnesses also noted that the two-year timeframe does not account for the rapid pace of change in some risks, particularly technological risks. The Trustworthy Digital Infrastructure for Identity Systems programme at the

363 [Q 262](#) (Roger Hargreaves)

364 [Q 5](#) (Roger Hargreaves)

365 [Q 236](#) (Lord Harris of Haringey)

366 [Q 207](#) (Dr Carina Fearnley)

367 [Q 288](#) (Sir Patrick Vallance)

Alan Turing Institute note that: “a failure to recognise the speed at which a risk can change from low likelihood to high is a significant blind spot.” They term this attribute the “velocity of a risk” and recommend that the velocity of a risk also be examined as well as the risk itself.³⁶⁸ Airmic, the Association of Insurance and Risk Managers in Industry and Commerce, suggested to us that the NSRA and NRR should “be updated more frequently than it typically has been, otherwise organisations will be using a Register as a benchmark which will not be synchronised with their reality, nor reflect the velocity of change”.³⁶⁹ A blanket approach which uses a two-year time frame for all risks is not appropriate and will lead to inaccurate risk assessments.

203. Our witnesses proposed that the NSRA should become a ‘live’ document, with risks being continually reassessed. The Institute of Risk Management, a professional body in Enterprise Risk Management, said that it “should be a ‘live’ and constantly updated tool that supports decision-making, not an end in itself.”³⁷⁰ Professor Gideon Henderson, Chief Scientific Adviser at the Department of Environment, Food and Rural Affairs, stressed to us, however, that a regular deadline was still valuable:

“You need a continuous assessment of what risks look like and how they are evolving, but, if you do not have some sort of regular repeat, it does not force action; it does not make you draw a line under things and look at things on paper. Some sort of deadline in the process is quite a useful component, but it is no surrogate for continually inspecting the risks.”³⁷¹

Impact and likelihood

204. The NSRA assesses the impact and the likelihood of a particular risk scenario occurring in the next two years and plots the results on a matrix. The risk matrix is a primary tool in the NSRA to enable assessment and prioritisation of risks, with each risk assessed on the basis of the combination of impact and likelihood. Although impact may be more straightforward to estimate in terms of ‘reasonable worst case scenarios’, in many cases there is considerable uncertainty in estimating the likelihood. This can result in likelihood uncertainties spanning at least an order of magnitude. This is particularly the case for risks where statistical data is not available such as malicious risks. In such cases of high uncertainty, where likelihood is very difficult to estimate, it is questionable as to what confidence can be placed in the risk matrix and how it can be meaningfully used in terms of prioritisation, planning and strategic direction. Our witnesses raised a number of concerns regarding how likelihood is determined and understood by decision makers. Sir Patrick Vallance noted the difference in calculating the likelihood of malicious and non-malicious risks can result in “a potentially skewed planning and funding system.”³⁷² Sir Patrick cautioned against decision makers reading directly across from the impact-likelihood matrix to determine what level of attention they should give a particular risk.³⁷³ Dr Millett said: “It is very easy to get caught up in the likelihood” and that “We can often forget the impact

368 Written evidence from the Trustworthy Digital Infrastructure for Identity Systems programme (The Alan Turing Institute) ([RSK0058](#))

369 Written evidence from Airmic ([RSK0053](#))

370 Written evidence from the Institute of Risk Management ([RSK0055](#))

371 [Q 288](#) (Professor Gideon Henderson)

372 [Q 288](#) (Sir Patrick Vallance)

373 [Q 288](#) (Sir Patrick Vallance)

assessment and therefore forget that very unlikely and very infrequent risks have an impact that is so large that we cannot afford to set them aside.”³⁷⁴

205. Witnesses also told us that the current impact scale is too simple. Sir John Beddington said that the current impact scale, which is achieved by taking the average of the impact scores across a range of dimensions, is not meaningful.³⁷⁵ Sir John suggested that what is needed is “a significant disaggregation of impact effects” and that “the potential impact and the variation of that should be more widely publicised, alongside the basic risk register and some disaggregation of key risks.”³⁷⁶

Risk or consequence

206. The NSRA focuses on discrete risk events, assessing their individual impact and likelihood. However, witnesses suggested that it would be more valuable for the NSRA to give more attention to the consequences of a disruptive event rather than to the cause. As Andy Bord, Chief Executive of Flood Re, summarised, “... it is not the flooding itself; it is the consequence of flooding that is of risk to the country.”³⁷⁷
207. Sir David Spiegelhalter and Dr Freeman noted that rather than specific disruptive events, “It is the downstream, knock-on consequences of disruptive events that are important, and these are often very similar to each other”. They recommended that “It might therefore make more sense to think in reverse—from ‘bottom up’: focussing on the proximal impacts first”.³⁷⁸ Sir Oliver Letwin pointed to the value of being able to respond to a wide range of possible events, saying that the UK needs “the capacity to deal in a non-specific way not with the thing that is afflicting us but with the fallout from it—the consequences of it.”³⁷⁹ Similarly, Resilience First said that “it would be better to focus again on the potential consequences (impacts) and pay less attention to a matrix based on past experiences or uncertainty of not knowing.”³⁸⁰
208. Our witnesses also suggested that the NSRA should go beyond a list of assessed risks and should also include information on vulnerabilities and possible mitigations. Sir Mark Walport said:
- “a good risk register should drive thinking about how risks can be prevented, mitigated, handled if they transpire and cleared up afterwards. The NRA [as previously named] is used fairly effectively for the handling and clearup but variably to derive decisions about prevention and mitigation.”³⁸¹
209. This absence of mitigation was also noted by Lord Harris who said: “you have the National Risk Register but you do not have next to it the series of mitigations that are in place, which you would normally get in a risk register.”³⁸² Sir Oliver Letwin suggested to us what such a document could look like:

374 [Q 15](#) (Piers Millett)

375 [Q 28](#) (Professor Sir John Beddington)

376 [Q 41](#) (Professor Sir John Beddington)

377 [Q 53](#) (Andy Bord)

378 Written evidence from Professor Sir David Spiegelhalter and Dr Alexandra Freeman ([RSK0057](#))

379 [Q 259](#) (Sir Oliver Letwin)

380 Written evidence from Resilience First ([RSK0015](#))

381 [Q 34](#) (Professor Sir Mark Walport)

382 [Q 236](#) (Lord Harris of Haringey)

“If the strategy turned into a short document that identified the main risks, set out plans for strengthening our resilience against those risks and, above all, established a mechanism for a flexible, ex-post response in the light of the unknown or unanticipated occurring, it would be a very valuable exercise.”³⁸³

210. Dr Kristen MacAskill suggested that the current impact/probability assessment could be replaced by an impact/capability assessment which would “focus on possible impacts of a threat or hazard and then consider how well a system can respond to it”.³⁸⁴ Professor Jim Hall, Dr Raghav Pant, Dr Ed Oughton, Dr Elco Koks, Dr Edoardo Borgomeo, Dr Scott Thacker, and Tom Russell proposed: “a vulnerability-based approach, which identifies points in infrastructure networks with the most potential to cause disruption”, to focus surveillance and preparedness.³⁸⁵
211. Professor Ortwin Renn, Scientific Director at the Institute for Advanced Sustainability Studies, described to us the classification system they have devised. Professor Renn noted that plotting likelihood and impact does not allow for a full understanding of the context and specific properties of risks.³⁸⁶ Professor Renn’s categorisations are designed to group risks based on how they need to be managed. The detail of Professor Renn’s classification system is outlined in Box 9. Variations of this system are used by Germany, the Netherlands and Switzerland.³⁸⁷
212. The common consequences of risks contained within the NSRA, and their maximum plausible scale, duration and magnitude, are drawn together to form the National Resilience Planning Assumptions.³⁸⁸ The National Resilience Planning Assumptions are used to develop generic plans which can respond to the common consequences of many risks.

383 [Q 250](#) (Sir Oliver Letwin)

384 Written evidence from Dr Kristen MacAskill ([RSK0046](#))

385 Written evidence from Professor Jim Hall, Dr Raghav Pant, Dr Ed Oughton, Dr Elco Koks, Dr Edoardo Borgomeo, Dr Scott Thacker, and Tom Russell ([RSK0052](#))

386 [Q 22](#) (Professor Ortwin Renn)

387 [Q 22](#) (Professor Ortwin Renn)

388 College of Policing, ‘Civil emergencies: Planning’: <https://www.app.college.police.uk/app-content/civil-emergencies/civil-contingencies/planning/> [accessed 22 November 2021]

Box 9: Professor Ortwin Renn's Risk Classification System

An alternative way to characterise and represent risk was developed by Ortwin Renn using nine indicators to provide a more in-depth representation of the risk. These nine indicators were: extent of damage, probability of occurrence, incertitude (uncertainty), ubiquity, persistency, reversibility, delay effect (latency between event and impact), violation of equity and potential of mobilization (social disorder).

Renn's system suggests these risks should be treated differently, both in evaluation of the impact and in management strategies. Renn distilled these nine criteria into six risk classes, and assigned them names from Greek mythology:

- Damocles sword: high impact, low probability risks e.g., technological risks such as nuclear energy and largescale chemical facilities
- Cyclops: high impact risks with significant uncertainty in the likelihood assessment e.g., natural events, such as floods and earthquakes.
- Pythia: risks where the extent of impact, the size of impact and the likelihood are highly uncertain e.g., human interventions in ecosystems
- Pandora's box: risks where there is uncertainty in both impact and likelihood, and the damage would be irreversible, persistent and wide-ranging e.g., the use of organic pollutants
- Cassandra: risks where the likelihood and impact are both high and relatively well known but there is delay between the triggering event and the occurrence of damage leading to low societal concern e.g., anthropogenic climate change
- Medusa: low probability and low damage risks where there is a large gap between public risk perception and expert risk analysis e.g., mobile phone usage and electromagnetic fields

Given its grounding in Greek mythology, Professor Renn's classification system may not represent the most public-friendly taxonomy. However, grouping risks in the manner is valuable in helping policymakers to consider families of risks which required similar management strategies.

Source: Government Office for Science, *Blackett Review of High Impact Low Probability Risks* (January 2012) pp 42–44: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/278526/12-519-blackett-review-high-impact-low-probability-risks.pdf [accessed 30 November 2021]

Interdependencies and systemic risk

213. It is important that a risk assessment process can account for interdependent or systemic risks. These are risks which would have wide ranging impacts which go far beyond the failure of one part of a system. As noted by Dr Justin Okoli: “Modern day risks are hardly ever linear or discrete; a single risk factor could impact upon a system in both direct and indirect ways, and sometimes create a perfect storm for the more significant risks to occur”.³⁸⁹ Several witnesses raised concerns about the risk posed by an increasingly interconnected society, and warned that the failure of any one part of the system was likely to produce significant and unexpected consequences.³⁹⁰ The Warwick Manufacturing Group at the University of Warwick warned that “The most significant extreme risks are likely to be those that are linked or

389 Written evidence from Dr Justin (RSK0061)

390 Q 32 (Professor Sir Mark Walport); Q 235 (Lord Harris of Haringey); Q 243 (Robert Harris); Q 207 (Dr Carina Fearnley)

systemic”.³⁹¹ Robert Harris, novelist, warned about the fragility of increasingly sophisticated societies, saying: “Sophisticated societies do collapse. Every civilisation collapses. You cannot think of one that did not face some terrible crisis, partly because they became so sophisticated.”³⁹²

214. As an example, Professor Hall described work done for the National Infrastructure Commission and Environment Agency which found that:

“If you stress the electricity system, 40% of the failures we tested lead to failures of other infrastructures that are dependent on electricity. In some analysis we did for the Environment Agency, while 15% of the homes in this country are at risk from flooding, 60% of homes are dependent upon infrastructure that is itself at risk from flooding. These interdependencies mean that the impacts from extreme events can be much greater than one might otherwise have thought.”³⁹³

215. However, the NSRA predominantly looks at discrete risks rather than interconnected risks. Suzanne Raine said that, within the NSRA, “There is something about the interconnectedness of the world and our dependencies on it that I think is not articulated.”³⁹⁴ Ed Butler, Chief Resilience Officer at Pool Reinsurance, suggested that the NSRA must consider not just the risk in isolation, but also “what systemic consequences result from such a high-impact event.”³⁹⁵

216. Accounting for linked or systemic risks is not an easy task. Ian Lisk warned that:

“it is not a nut that any country has cracked in a way that provides this nice, seamless, ‘There’s a bit of weather; there’s some flooding. Here’s the impacts and all the other things that can play a part in making that worse or better’.”³⁹⁶

217. The Trustworthy Digital Infrastructure for Identity Systems programme at the Alan Turing Institute also said: “While discrete risks are reasonably well understood and relatively easy to identify and assess (though not necessarily manage), systemic and linked risks provide a major challenge.”³⁹⁷ One area where there may be potential for improvement is in assessing the risk posed by the interdependencies between infrastructure sectors. Professor Hall noted that computational models of interconnected systems can help identify interdependencies and potential weak points.³⁹⁸

The number of risks and their breadth

218. The Cabinet Office acknowledge that the NSRA does not include every possible risk that the UK faces.³⁹⁹ However, the NSRA and NRR have increased in size with each successive iteration. Lord Ricketts expressed concern about the NRR’s swelling size:

391 Written evidence from the Warwick Manufacturing Group (WVG), University of Warwick ([RSK0059](#))

392 [Q 243](#) (Robert Harris)

393 [Q 159](#) (Professor Jim Hall)

394 [Q 82](#) (Suzanne Raine)

395 [Q 82](#) (Ed Butler)

396 [Q 65](#) (Ian Lisk)

397 Written evidence from the Trustworthy Digital Infrastructure for Identity Systems programme (The Alan Turing Institute) ([RSK0058](#))

398 [Q 159](#) (Professor Jim Hall)

399 Private correspondence with the Cabinet Office

“Now I look at the 2020 National Risk Register and I see it has grown again and become much more complex. It now has 38 risks measured along axes with five different levels of impact and five different levels of likelihood. While I am sure that is rigorous and valuable, I do not think it is much guide to prioritising resources.”⁴⁰⁰

219. Dr Blagden suggested that the ever-increasing size may be due to a desire not to be caught off guard: “We do not want to be proven wrong, so we either add more things to the lists or we broaden the categories.”⁴⁰¹ Sir Oliver Letwin warned that: “I do not think, on the whole, that doing something comprehensive is likely to be productive. By its nature, you cannot comprehensively deal with risks. There are loads of things that you will not be able to anticipate in advance.”⁴⁰²
220. Even within risks there is significant potential for multiple different scenarios to emerge. The fact that there are many different ways a risk might manifest was raised to the Committee by three Government Chief Scientific Advisers. They all suggested the need to use multiple scenarios to visualise the differences. Sir Mark Walport said that: “Within each risk, more of a scenario approach might be a better way of looking at it.”⁴⁰³ Sir John Beddington said that there is “enormous variation you see within an impact category between the very worst case, the reasonable worst case and the most probable case” and suggested the use of scenario analysis to address this.⁴⁰⁴ Sir Patrick Vallance told us that one area which needed more attention was whether multiple scenarios were needed to visualise a risk.⁴⁰⁵

Data - access and analytics

221. The NSRA and the public facing NRR are presented as static, word-based documents. Increasing volumes of data and improved abilities to process and present data represent an opportunity to improve the accuracy and presentation of the NSRA and NRR. Witnesses were enthusiastic about the potential for data to be better used in the risk assessment process. Ian Lisk told us that:

“... the policy area I am most interested in would be about better facilitating the exchange of data across the various agencies involved in coming up with the interoperable development of hazard-impact models, to inform both near-time risk assessments and the longer-term side of things.”⁴⁰⁶

Both Sir Patrick Vallance and Professor Brooke Rogers noted the need to understand what data are held, what data is needed, where it sits or who owns it, and how it will be made available, and for this to be known in advance of an emergency.⁴⁰⁷ Sir Patrick also drew attention to the value of data analytics and data visualisation to support decision makers during a response.⁴⁰⁸

400 [Q 71](#) (Lord Ricketts)

401 [Q 83](#) (Dr David Blagden)

402 [Q 250](#) (Sir Oliver Letwin)

403 [Q 29](#) (Professor Sir Mark Walport)

404 [Q 30](#) (Professor Sir John Beddington)

405 [Q 286](#) (Sir Patrick Vallance)

406 [Q 65](#) (Ian Lisk)

407 [Q 213](#) (Professor Brooke Rogers); [Q 289](#) (Sir Patrick Vallance)

408 [Q 289](#) (Sir Patrick Vallance)

222. **The current National Security Risk Assessment timescales and impact assessments are not suitable to address either high impact-low likelihood or chronic risk events. The two-year timeframe currently in place leads to an underappreciation of the risks associated with low-likelihood or chronic risks and will result in outdated assessments for risk areas with a high velocity of change. There is also a high degree of uncertainty associated with the reasonable worst-case scenario (RWCS) and likelihood calculations. The likelihood of many risks cannot be accurately quantified. The likelihood-impact matrix of the NSRA may be misleading and lead to a false sense of confidence.**
223. **The NSRA must be produced with mitigation and response in mind. The methodology of the NSRA and the Lead Government Department principle favour the assessment of discrete risks. This is an ineffective strategy given the interconnected nature of many risks. Risks are currently grouped by thematic areas, but risks within a given thematic area may require very different responses. Risk planning should focus on the outcome rather than the specific risk, and the NSRA should facilitate this. The national planning assumptions are one means to understand the capabilities required to respond to a range of possible scenarios.**
224. **The current format of the NSRA and NRR is too rigid. We believe that the current PDF format of the NSRA and NRR is difficult to navigate and may deter readers due to its cumbersome size. The NSRA is too long to be a useful document, and it increases in size with each successive iteration. Its purpose as a planning document is hampered by its attempts to be exhaustive. A shorter, more dynamic, web-based platform would facilitate access, make the underlying data more visible, and allow for the improved representation of interconnectedness.**
225. *We propose that instead of a simple risk assessment, the UK should produce a 'National Security Risk and Resilience Assessment'. This should place more emphasis on preparedness and resilience. The NSRA as a list of risks is of limited use and should be linked to emergency plans, simulations, capability development and proposed mitigations. This should be achieved through the following changes:*
- *The NSRA must focus more on the outcomes of emergencies. The document should be oriented around common consequences to allow for preparedness efforts which are not overly focused on discrete risks. This should be supplemented by a smaller list of very high-consequence risks or risks for which specialised planning is required.*
 - *Risks should be grouped using Ortwin Renn's categories (box 9) to ensure risks which require similar responses are considered together. We accept that the labelling of these categories may need to change to avoid any confusion.*
 - *Risks should be assessed on an impact-vulnerability matrix, as well as an impact-likelihood matrix.*

- *Where a risk may manifest in a number of ways, the NSRA should present several scenarios, not just the Reasonable Worst Case Scenario.*
- *The NSRA should include a number of cascading risk scenarios, whose development has been informed by interdependent infrastructure modelling.*
- *The NSRA should move to a five-year timeline, with risks refreshed and reassessed annually. Risks which are identified as having a high velocity of change should be assessed more regularly. Chronic risks, chronologically unpredictable risks, low-likelihood risks and the most significant risks should also be accompanied by a long-term assessment of 15 years.*
- *The Government should act under a presumption of publication, and should publish the content of the Official-Sensitive National Security Risk Assessment except where there is a direct national security risk.*
- *The data required for emergency response should be identified at the point that a risk is assessed, and all efforts should be made to ensure that data can be accessed from the outset of a crisis.*
- *The NSRA and NRR should be presented in a more dynamic, data driven web-portal which allows users to visualise the risk summary, access the underlying data and easily navigate to related risks.*

Business, industry and risk assessment

226. Industries would be affected by any of the risks identified in the NSRA materialising, and they have important roles to play in the response to those risks. However, our witnesses described an ad hoc or entirely absent engagement effort with business and industry by central government. Amongst our witnesses, only UKHospitality, a hospitality trade association, had any involvement in conversations about risk with central Government.⁴⁰⁹ Dr Marshall said:

“I do not recall ever having been invited by central government to a discussion around risk and its systemic impact on society or the economy, by the Civil Contingencies Secretariat or any other part of the machinery of central government.”⁴¹⁰

Huw Evans, Director General of the Association of British Insurers, noted that the Government has typically engaged with the insurance industry in an ad hoc manner and called for a standing forum for industry expertise.⁴¹¹

227. Leigh Pomlett, told us that:

“We, as an organisation and as a sector, were unaware of the risk register or any risk planning the Government did that was of any particular relevance to the supply chain industry. I come from a point of ignorance.

409 [Q 166](#) (Kate Nicholls)

410 [Q 165](#) (Dr Adam Marshall)

411 [Q 107](#) (Huw Evans)

I do not know about the government risk register. I am unaware of it. I do not know what work has been going on.”⁴¹²

228. Many conversations about risk take place locally and Dr Marshall praised the engagement undertaken by LRFs, saying that: “Local-level discussions on risk pre-pandemic were far stronger than they were centrally.”⁴¹³ Trade associations and professional bodies represent an appropriate level for nation-wide conversations.⁴¹⁴
229. These conversations represent not just an opportunity for the Government to inform business and industry of the risks it may face, but also to learn from them. Risk assessment is a routine process within business and industry, from small and medium enterprises (SMEs) to the operators of safety critical infrastructure. The Institute of Risk Management note that “risk identification exercises can benefit from broad ‘crowd funding’ input” and that “key players inside and outside Government should be asked for their input to challenge and sense-check the risk assessment”.⁴¹⁵
230. **The inclusion of industry and businesses in the production of the NSRA is necessary to ensure that information on business and industry capabilities is correct and up to date. This would also allow the Government to inform business and industry of the likely impact on their sectors of the realisation of any risks in the NSRA. Trade associations and professional bodies represent a good level at which to conduct these meetings. Conversely, the Government should draw on the expertise within business and industry to ensure the creation of the NSRA and NRR is driven by best practice. The Government should elicit information on risk assessment methodologies and modelling capabilities, particularly from the insurance sector, critical infrastructure and safety-critical industries.**
231. *The Government should establish a forum, made up of representatives of trade associations and professional bodies, which should meet in advance of and following the production of the NSRA or twice a year, whichever is more frequent. After five years, the Forum could then meet once a year. This body should be convened by the Office for Preparedness and Resilience and used to ascertain information about business sector capabilities, inform business and industry of risks which may require a response on their part, and allow the Government to seek out best practice. Attention should be paid to ensuring representation from the full breadth of UK business and industry, with a particular focus on the logistics sector. The Government should deliver annual presentations on realistic risk assessment and risk planning to business and industry bodies.*

The voluntary sector and risk assessment

232. The voluntary sector often has close ties to a local community and a deep knowledge of the area they operate in.⁴¹⁶ As Richard Lee reminded us, “‘Volunteer’ does not mean ‘amateur’”.⁴¹⁷ Volunteers are often situated

412 [Q 165](#) (Leigh Pomlett)

413 [Q 165](#) (Dr Adam Marshall)

414 [Q 166](#) (Kate Nicholls)

415 Written evidence from the Institute of Risk Management ([RSK0055](#))

416 [QQ 232-233](#)

417 [Q 234](#) (Richard Lee)

within the community they serve, and as such are an established and trusted link to the community.⁴¹⁸ Alistair Read told us about the experience of some Mountain Rescue volunteers: “Volunteers buy into the cause and are often engaged for the long term ... I have team members who have been around for 30 or 40 years and have that long-standing, in-depth knowledge of how we have evolved what we are doing today.”⁴¹⁹

233. In spite of the capabilities offered by the voluntary sector, the level of engagement between both central government and LRFs and the voluntary sector is variable. Alistair Read told us that: “it is a challenging communication process in peacetime and does not seem to get any easier if we are fighting any of the battles.”⁴²⁰ Alistair Read noted that engagement locally was often better than it was at a national level.⁴²¹ Richard Lee told us, however, that sometimes decisions made nationally would not be communicated to the local level, leading to confusion: “As for communication difficulties, during the pandemic it felt that there was sometimes a disconnect between central and local.”⁴²²

234. Mountain Rescue England and Wales argued that the knowledge held by the voluntary sector could be better utilised in the national risk assessment process:

“... it is not uncommon to have volunteers with 30-40+ year experience (often at the front of community incidents) but there is little national level engagement to bring that expertise to bear, gather information and develop a broader and deeper process to inform national risk assessment.”⁴²³

235. **The Government should recognise that voluntary organisations often operate to professional standards of delivery and have unparalleled depth of practical and local knowledge.**

236. *At a national level, the Government should involve major voluntary organisations in the production of the NSRA. This is to ensure that the knowledge they possess on risks and levels of community resilience, as well as information on their operational capabilities, can be included. The Government needs to recognise that the voluntary sector possesses many skills that will be crucial to building societal resilience. This should be facilitated through the single point of contact we recommended in Chapter 4.*

Communication with the public

The value of communicating risk

237. Active communication with the public about risk is a crucial element of a comprehensive resilience strategy. Both Sir Mark Walport and Sir John Beddington argued that the public have a moral right to be informed about the risks they might face, and that informing the public properly leads to a more effective emergency response.⁴²⁴ Sir Mark noted that in countries such

418 [Q 231](#) (Adrian Clee)

419 [Q 223](#) (Alistair Read)

420 [Q 230](#) (Alistair Reed)

421 [Q 230](#) (Alistair Reed)

422 [Q 230](#) (Richard Lee)

423 Written evidence from Mountain Rescue England and Wales ([RSK0018](#))

424 [Q 38](#) (Roger Hargreaves)

as New Zealand and Japan, the population have a greater awareness of the risks they may face and how they can protect themselves against them.⁴²⁵ As raised in paragraph 185, there is no evidence that providing the public with risk and resilience information leads to panic amongst the population.⁴²⁶

238. Dame Sue Ion said that building trusted and reliable risk communication strategies would be central to the management of the UK population's response to emergency events. Dame Sue's evidence highlighted the need for trust to be built between people and "those best placed to give advice" in order to foster a proportionate response to a Fukushima style nuclear disaster.⁴²⁷ Dame Sue said:

"All the information coming out of Fukushima indicates that the radiation risk was minimal and that far more issues, in terms of health, mental wellbeing and everything else, have been caused due to the stress of evacuation rather than the effect of radiation at the incident. [...] There are many fears that are unfounded, but it has been almost impossible for the nuclear community, and Governments generally, which are often ill-informed, to get the facts as opposed to the myths across."⁴²⁸

239. In Sweden, the public is considered a key building block of national resilience. Jim Kronhamn told us about the Swedish approach to communication:

"Our attitude is openness with this kind of important community information to the population. We find that people have the right to know what potential threats we are facing and, most important of all, how they can prepare themselves and handle a difficult situation."⁴²⁹

240. Public engagement also helps to improve the Government's understanding of the capabilities and vulnerabilities of the population, creating a more robust risk assessment. Dr Fearnley told us that: "The public are a very useful source of information and we should be leveraging that and integrating that into the communication processes and decision-making processes."⁴³⁰

241. We appreciate the difficulties associated with undertaking a population level engagement exercise to inform the NSRA and NRR. Roger Hargreaves said: "We cannot just open the floodgates and have everybody with any passing interest in any risk throwing in their two penn'orth because they feel they have some thoughts on what we should be doing."⁴³¹ The national risk assessment and its associated plans have the capacity to substantially impact the lives of the population. A mechanism needs to be created by which the public can be effectively encouraged to have a say in its construction.

242. The value of community level communication and engagement was highlighted by our witnesses. Professor Shaw said:

"communities should be able to pinpoint vulnerabilities more effectively than somebody who is quite distant from a community" and that two-way communication between Government and communities means

425 Q 38 (Professor Sir Mark Walport)

426 Q 197 (Alexander Fekete)

427 Q 134 (Dame Sue Ion)

428 Q 134 (Dame Sue Ion)

429 Q 197 (Jim Kronhamn)

430 Q 208 (Dr Carina Fearnley)

431 Q 7 (Roger Hargreaves)

that “when something changes in the community there is a surveillance mechanism there to ensure that local knowledge can be pushed up into government, so it can begin to adapt its understanding of what the risk is.”⁴³²

243. **We believe that voluntary and community organisations represent an appropriate level at which to undertake engagement, particularly as it would allow the Government to target support towards vulnerable or at-risk groups. We also consider that Parliament offers a means of indirect engagement between the public and Government.**

The National Risk Register

244. There is very little active communication from the Government to the general public about the risks they face. The main form of public communication by the Government is via the publication of the NRR. The NRR is a 140-page PDF document, hosted on GOV.UK. It includes a risk matrix based on the NSRA and individual risk summaries. It also contains information directed at individuals and communities including preparedness advice and information on volunteering, mental health needs in crises, and vulnerable/at-risk groups.
245. Our witnesses were roundly sceptical of the value of the NRR as a risk communication tool. Dr Fearnley said: “The risk registers and risk matrices are very important in terms of cataloguing what the risks are out there, but I do not see them as an effective tool to communicate risk to the public.”⁴³³ Lord Ricketts said that: “I am not sure many people would know of its existence to guide them in how to deal with a risk that arose.”⁴³⁴ Sir David Spiegelhalter noted the lack of media coverage or publicity around the NRR.⁴³⁵ This view was also echoed by the then Paymaster General who told us: “Nobody here is expecting people to go and rummage through GOV.UK and apprise themselves of how they engage with and contribute to the resilience of the nation by reading the risk register.”⁴³⁶
246. The NRR was primarily envisaged as a document to guide local emergency planners, resilience professionals and businesses in their risk assessment and risk planning.⁴³⁷ Professor Rogers noted that it is difficult for the NRR to fulfil both this role and to act as a public communication tool: “Thinking about it as a public communication tool requires more of a transformation.”⁴³⁸ This was echoed by Dr Fearnley who noted that in order for the NRR to have impact, it would be crucial to determine what it is trying to achieve first.⁴³⁹
247. **The Government must recognise that informing the public about the risks they face is both morally justified and benefits societal resilience. Knowledge on how the public understands risk and the population’s level of resilience is crucial to the development of**

432 Q 211 (Professor Duncan Shaw)

433 Q 211 (Dr Carina Fearnley)

434 Q 71 (Lord Ricketts)

435 Q 207 (Professor Sir David Spiegelhalter)

436 Q 271 (Penny Mordaunt MP)

437 Cabinet Office, *National Risk Register* (December 2020) p5: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/952959/6.6920_CO_CCS_s_National_Risk_Register_2020_11-1-21-FINAL.pdf [accessed 30 November 2021]

438 Q 207 (Professor Brooke Rogers)

439 Q 207 (Professor Sir David Spiegelhalter)

rigorous risk assessment and planning. Voluntary and community groups can provide key insights on these issues. There needs to be a new culture within Government which recognises that not shielding the population, and instead providing information on risks, will lead to a more cohesive risk response. Better publicity of the NRR is essential to ensure that the public are aware of the risks that they may face and to outline the expectations on them in any risk scenario. This will require a re-consideration of the format of the NRR.

248. *The NRR should, in line with the NSRA, be presented via a dynamic, data driven web-portal which is easily navigated, evolves in response to identified threats and which provides practical, targeted advice to individuals. Its profile must be increased through an active and continuing media campaign, including via social media. This campaign should heighten whenever substantive changes are made to the risk register. It should focus on informing society of the content of the NRR and how they could use the NRR to bolster their personal preparedness.*
249. *When conducting the national risk assessment process, the Government should engage with voluntary and community groups to ascertain information on risks and population level resilience.*

Box 10: Eyjafjallajökull Volcanic Eruption Case Study

During our inquiry we received evidence on the handling of the Eyjafjallajökull eruption. This case study highlights the weaknesses of the UK's risk assessment process with specific reference to identifying and planning for risks which originate overseas and have a low likelihood of impacting the UK.

Eyjafjallajökull is a subglacial volcano in the south of Iceland which erupted in 2010. The eruption lasted for 39 days, from April to May 2010, reaching level 4 on the Volcanic Explosivity Index (VEI) and caused ash to disperse widely across Southern and South Eastern Iceland and Western Europe.⁴⁴⁰ The London Volcanic Ash Advisory Centre (VAAC) issued ash warnings depicting the presence of ash over large parts of Europe and the North Atlantic.⁴⁴¹ In response to concerns that the volcanic ash could damage aircraft engines, windscreens and avionics, 300 airports in 12 European countries were closed between 15 April and 21 April 2010. This impacted air travel across the world, affecting 7 million customers and costing the airline industry \$1.7 billion USD.⁴⁴² The extensive closure of airspace highlights how a lack of preparedness and an adherence to the precautionary principle can lead to an excessive response.

Within the UK Government, the Department for Transport and the Foreign and Commonwealth Office (FCO) were identified as the Lead Government Departments with GO-Science to support SAGE providing scientific advice to COBR.⁴⁴³

Assessing the risk of volcanic eruption

Prior to the eruption of Eyjafjallajökull, the risk posed by a volcanic eruption in Iceland had not been fully appreciated by the UK Government. Sir John Beddington, the Government Chief Scientific Adviser at the time of the incident, said that, in spite of the high frequency of eruptions, “nobody had thought about any risk from volcanoes in Iceland.”⁴⁴⁴ As a consequence of this, the 2008⁴⁴⁵ and 2010⁴⁴⁶ National Risk Registers did not include any reference to volcanic activity. Debbie Lewis, a resilience preparedness consultant for Axiom Limited, said that due to this blind spot on the risk assessment, no preparation to mitigate against the effects of a volcanic eruption had occurred.⁴⁴⁷ Moreover, Ian Lisk acknowledged that scientific projections from within the Government advice network underestimated the severity and longevity of Icelandic volcanic threats.⁴⁴⁸

440 Britannica, ‘Eyjafjallajökull volcano’: <https://www.britannica.com/place/Eyjafjallajokull-volcano> [accessed 5 October 2021]

441 Met Office, ‘London Ash Advisory Centre (VAAC)’: <https://www.metoffice.gov.uk/services/transport/aviation/regulated/vaac/index> [accessed 22 November 2021]

442 Volcanic Ashfall Impacts Working Group, ‘Aviation’: https://volcanoes.usgs.gov/volcanic_ash/ash_clouds_air_routes_eyjafjallajokull.html [accessed 22 November 2021]

443 Written evidence received by the Science and Technology Committee, inquiry on Scientific advice and evidence in emergencies (Session 2010–12) [SAGE00](#)

444 [Q 33](#) (Professor Sir John Beddington)

445 Cabinet Office, *National Risk Register* (July 2008): https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/969213/20210310_2008-NRR-Title-Page_UPDATED-merged-1-2.pdf [accessed 30 November 2021]

446 Cabinet Office, *National Risk Register of Civil Emergencies* (March 2010): https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/211853/nationalriskregister-2010.pdf [accessed 30 November 2021]

447 Written evidence from Debbie Lewis ([RSK0021](#))

448 [Q 62](#) (Ian Lisk)

The risk assessment process is not well equipped to assess risks of which the UK has not previously had direct experience. Many of these events can be considered ‘black swans’: risks that are nearly impossible to foresee, risks that we know little about or known risks which the country is unprepared for because of the high cost of the mitigation required to minimise the threat.⁴⁴⁹ Black swan events are unpredictable due to their rare occurrence and the corresponding lack of historical evidence from which to make frequency predictions which might anyway be unreliable. Dr Simon Harwood said that the current risk registers contain mostly grey swans in the form of known threats. Dr Harwood argued that the UK does not have a robust process to identify black swans.⁴⁵⁰

The Government’s risk assessment programme should not be dependent on historical data. As noted by the Resilience Shift, historical data cannot account for black swan events and “historical datasets (e.g., historical climate data or performance data) are no longer reliable indicators of future risk.”⁴⁵¹ Ian Lisk acknowledged that the 2010 volcanic eruption was a “wake-up call” for the government who need to be prepared for risks that they were not expecting.⁴⁵² However, even now, the NRR focuses primarily on the risk posed by an Icelandic volcanic eruption.⁴⁵³

449 [Q 82](#) (Dr Simon Harwood); Written evidence from Greater Manchester Combined Authority ([RSK0072](#))

450 [Q 82](#) (Dr Simon Harwood)

451 Written evidence from Resilience Shift ([RSK0064](#))

452 [Q 62](#) (Ian Lisk)

453 Cabinet Office, *National Risk Register 2020* (December 2020) p 37: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/952959/6.6920_CO_CCS_s_National_Risk_Register_2020_11-1-21-FINAL.pdf [accessed 30 November 2021]

CHAPTER 6: RISK PLANNING

250. Risk assessment is only one step in the process of managing risk and must be followed by thorough risk planning. As Sir Mark Walport summarised: “The risk assessment is the starting point. It is then a decision as to how much energy you put into each of the possible scenarios.”⁴⁵⁴ This chapter discusses risk planning, which we understand to mean all the efforts undertaken to ensure the UK is prepared for a risk before it manifests. This includes efforts to prevent the risk manifesting or limiting its impact.
251. Planning for risk occurs at all levels, from international efforts to prevent terrorism to personal efforts to limit the impact of household flooding. This chapter looks at risk planning at three levels: central government; Local Resilience Forums (LRFs); and business and industry.

Central government

The Lead Government Department and siloes

252. Planning for risks identified in the National Security Risk Assessment (NSRA) is undertaken by the relevant Lead Government Department (LGD) at a national level. A LGD is responsible for planning and preparing for risks contained in its portfolio, and the Secretary of State ultimately is accountable for departmental preparedness. A LGD is only the ‘lead’, it is expected to convene discussions with all other departments that hold an interest in that risk. The Civil Contingencies Secretariat (CCS) play a refereeing and arbitration role in those discussions.⁴⁵⁵
253. Witnesses agreed that the LGD principle is a sound one in theory, representing the simplest and most practical way to allocate responsibility for a given risk.⁴⁵⁶ However, witnesses also highlighted that almost every risk implicates multiple departments.⁴⁵⁷ Planning for specific risks in the NSRA must involve all relevant departments to ensure there are no major gaps in preparedness which could heighten disruption should a risk materialise.
254. In practice, the LGD principle leads to siloed planning and a failure to consider risks in the round. Charlotte Pickles said that the LGD principle “... has ended up exposing us to a severe level of under planning in areas that are not the responsibility of the Lead Government Department for a particular risk.”⁴⁵⁸ For example, Charlotte Pickles noted that the Department for Education had no specific policy on how to respond to a pandemic.⁴⁵⁹ Professor Collins said: “We just do not do “joined-upness” very well at all. I do not believe that we do risk assessment and planning in a joined-up way, with sufficient depth and accuracy, and with sufficient foresight that enables us to do a better job.”⁴⁶⁰
255. Kate Nicholls said that one issue with siloed risk planning is the failure to learn lessons from the experiences of other departments, saying, “When you look at what government does, it tends to be very siloed. They are risk-owning

454 [Q 30](#) (Professor Sir Mark Walport)

455 [Q 7](#) (Roger Hargreaves)

456 [Q 31](#) (Professor Sir Mark Walport); [Q 214](#) (Charlotte Pickles); [Q 260](#) (Margaret Beckett, Sir Oliver Letwin, and Lord Gus O’Donnell)

457 [Q 31](#) (Professor Sir Mark Walport)

458 [Q 214](#) (Charlotte Pickles)

459 [Q 214](#) (Charlotte Pickles)

460 [Q 236](#) (Professor Brian Collins)

departments and you do not necessarily learn the lessons from one to the other. You do not necessarily translate across all those risks.”⁴⁶¹ This failure to plan across departments was noted by representatives of the Ministry of Defence who drew attention to an issue identified during an exercise they ran to explore the impact of both COVID-19 and Brexit:

“Departments were potentially planning in isolation and not understanding the interdependencies between their needs for support or their need to support each other.”⁴⁶²

256. There is no formal mechanism to ensure departments work together on risks which cross departmental boundaries. Sir Mark Walport called into question the ability to ensure there is cross-government working: *“The question is who holds the stick to ensure that departments work together effectively. It is quite difficult to see any mechanism over and above them.”*⁴⁶³ The CCS do not have the ability to compel departments to work together to produce plans. They can encourage the involvement of other departments and arbitrate in the case of disagreements, but this light touch approach was identified as an area requiring improvement by the Director of the CCS.⁴⁶⁴

Assurance and audit

257. There is no formal auditing of departmental preparedness for risks identified in the NSRA. Charlotte Pickles described a “woeful lack of scrutiny and accountability” in ensuring preparedness.⁴⁶⁵ Dr Stone noted that “we are missing a complete level of governance and accountability of big risks in the UK”.⁴⁶⁶ Within Government, the CCS do not formally audit departmental planning, instead they “bring pressure to bear on departments if we think that there are risks that are not being dealt with properly”.⁴⁶⁷ The Director of the CCS, Roger Hargreaves, described the current approach taken by the CCS is “one of support rather than audit ... It is carrot rather than stick.”⁴⁶⁸ Witnesses were critical of this lack of internal auditing. Lord Ricketts said: that “there is no point in setting priorities and taking decisions to do things unless they are followed up and progress chasing is done systematically.”⁴⁶⁹
258. SRSRM Ltd noted that: “at national, regional and local level ministers and officials have no effective assurance that plans are in place and that they are effective”.⁴⁷⁰
259. Alex Thomas was sceptical of the ability of the CCS to undertake such an audit role, saying that they do not have “the levers or the authority to make sure that departments ... are embedding risk into their decision-making”.⁴⁷¹ As discussed in Chapter 3, we recommend the creation of an Office for Preparedness and Resilience which would be responsible for producing independent analysis on UK preparedness.

461 [Q 163](#) (Kate Nicholls)

462 [Q 184](#) (Major Charles Stickland)

463 [Q 31](#) (Professor Sir Mark Walport)

464 [Q 7](#) (Roger Hargreaves)

465 [Q 214](#) (Charlotte Pickles)

466 [Q 141](#) (Dr Tim Stone)

467 [Q 8](#) (Roger Hargreaves)

468 [Q 12](#) (Roger Hargreaves)

469 [Q 78](#) (Lord Ricketts)

470 Written evidence from SRSRM Ltd ([RSK0054](#))

471 [Q 217](#) (Alex Thomas)

260. Outside of the Government, Parliament has a key role checking and challenging the work of Government. However, witnesses felt that this role had not been adequately performed in the area of risk planning Charlotte Pickles said:

“Parliament played no role whatever in scrutinising whether we were ready for a lot of these risks. Scrutinising the Executive is one of the primary roles of Parliament, yet the last report on the risk of a pandemic was over a decade ago, produced by a Lords committee. I think that tells us something about how involved Parliament is in the scrutiny process.”⁴⁷²

Witnesses called on Parliament to take a more active role in scrutinising preparedness against risks in the NSRA.⁴⁷³ Charlotte Pickles noted that the current format of departmental select Committees in the Commons is unlikely to break down the siloed approach to risk planning.⁴⁷⁴

Mitigation and prevention

261. Planning does not just involve work to plan a response when an emergency occurs. It should also involve work to mitigate the impact of an emergency or prevent it where possible. Dr Fearnley noted that the cost-benefit analysis favours mitigation or prevention over response.⁴⁷⁵ Unlike in corporate settings, where risk assessments are linked to mitigating actions, witnesses criticised the failure to use the NSRA for mitigation or prevention. Sir Mark Walport said:

“If I had to identify one substantive weakness, it is that the risk assessment has been used mainly for cleanup and management, and not enough for prevention.”⁴⁷⁶

262. Witnesses noted that those dealing with threats, such as the Ministry of Defence or those working with elements of critical national infrastructure, often sought to avert the threat. By contrast, they noted that civil departments dealing with hazards were less inclined towards mitigation or prevention. Witnesses praised the Ministry of Defence’s work on preventing hazards and suggested it should be emulated elsewhere. Sir Oliver Letwin said:

“Inside the Ministry of Defence, there are all sorts of people planning for things that have not yet happened. They do that very seriously, and they spend a lot of time and a lot of our **money** doing that sort of thing. Whether they do enough of it and do it well enough, I do not know, but they are serious about it. Outside the Ministry of Defence, government is not serious about these matters.”⁴⁷⁷

Roger Hargreaves said that for those managing critical national infrastructure “getting them to behave in a resilient way is more straightforward, because there is either a legal obligation or obvious and direct government support”.⁴⁷⁸ Lord Houghton of Richmond, Former Chief of Defence Staff of the British

472 [Q 214](#) (Charlotte Pickles)

473 [Q 214](#) (Charlotte Pickles); [Q 237](#) (Lord Harris of Haringey)

474 [Q 217](#) (Charlotte Pickles)

475 [Q 212](#) (Dr Carina Fearnley)

476 [Q 34](#) (Professor Sir Mark Walport)

477 [Q 252](#) (Sir Oliver Letwin)

478 [Q 9](#) (Roger Hargreaves)

Armed Forces, suggested the need for a “switch in the mindset” of other government departments towards more contingency planning.⁴⁷⁹

263. We note that the NSRA and NRR contain both threats and hazards. However, their production is overseen by the Civil Contingencies Secretariat, a name which implies a focus on civil issues rather than national security. This naming disconnect was noted by Dr Blagden who said: “It is interesting, first of all, that this National Risk Register and National Security Risk Assessment—merged things that they are—is ultimately owned by the Civil Contingencies Secretariat.”⁴⁸⁰

264. It is unlikely that emergencies will transpire in precisely the way they were planned for. Sir Oliver noted dealing with these unexpected emergencies:

“We, in particular, are weakest in knowing how to deal with circumstances that arise despite our best efforts, and in having flexible responses that do not depend on having guessed what will happen and why it will happen but that are capable of adapting themselves rapidly and effectively to the circumstances that we meet.”⁴⁸¹

Witnesses were, however, at pains to stress the value of planning even if the plan and scenario are not perfectly in agreement. Paul Wyatt stressed to us that, “A plan, even if on the title it says it is for a particular thing, can become applicable to other things. Templating is quite powerful.”⁴⁸²

265. **Preparedness and planning for risks in the National Security Risk Assessment (NSRA) should cover all possible impacts of a risk and must aim for mitigation or prevention where possible. Within the national security, defence and critical national infrastructure communities there is a strong emphasis on prevention, which should be replicated in all areas. There is currently an excess of siloed planning and a failure by departments to plan for risks for which they are not the LGD. This creates significant vulnerabilities. The CCS currently do not have sufficient power to compel departments to work together or to compel preparation on specific risk areas. More cross-departmental working is needed, and departments must plan for all risks which may affect them, not simply those for which they are nominally responsible. There is, overall, an absence of auditing of departmental risk planning at all levels. In particular, the Committee recognises that Parliament has been too passive in its responsibility to scrutinise risk plans and should assist the audit of Government preparedness.**

266. *Central government risk planning should be benchmarked against the National Security Risk Assessment (NSRA), with standards of preparation and required capabilities set by the Office for Preparedness and Resilience (see paragraph 79). The CCS should convene cross-departmental working groups to address the most significant cross-cutting risks and to ensure that risk scenarios that cross departmental boundaries have risk plans that cover the full spectrum of possible impacts. These risks should be considered*

479 [Q 122](#) (Lord Houghton of Richmond)

480 [Q 85](#) (Dr David Blagden)

481 [Q 250](#) (Sir Oliver Letwin)

482 [Q 184](#) (Paul Wyatt)

discretely by the Threats, Hazards, Resilience and Contingencies subcommittee of the National Security Council to ensure that there is ministerial discussion of these risks.

267. *A yearly debate on the National Security Risk Assessment (NSRA) should be held by both Houses of Parliament. To ensure more in-depth scrutiny, the Office for Preparedness and Resilience should audit departmental preparedness and conduct deep dives into departmental risk management. These audits should be based on the standards of preparation and required capabilities as set out by the Office for Preparedness and Resilience, with annual reports signed off by ministers and laid before Parliament for debate. They should investigate where there has been a failure to invest in preparedness, and conduct assessments of the cost of such failures. A new Joint Select Committee should be created to scrutinise and democratise the UK's risk planning approach and the work of the CCS. The Committee propose that this should be called the Joint Resilience and Contingencies Select Committee and should have access to all relevant information, including the NSRA. The National Audit Office has the power to investigate the Government's risk preparedness through the lens of public spending. The NAO should continue its valuable work scrutinising risk management in Government.*
268. *The Government should change the name of the Civil Contingencies Secretariat in acknowledgement that the secretariat no longer manages civil emergencies alone. A name should be chosen which reflects its broad portfolio of threats and hazards. The Committee recommend the use of the 'Resilience and Contingencies Secretariat'.*

Exercising

269. Exercising is integral to planning and preparation, allowing for plans to be validated, individuals to form essential relationships, test their capabilities and practise their roles, and procedures to be tested. The evidence received by the Committee was unanimous in its support for the value of exercising, with calls for increased exercising and war-gaming,⁴⁸³ Athena said:

“At the root of all good risk management and resilience is business continuity training and exercising, especially when risks are pan Government in nature. Multiple studies have shown that exercising not only exposes second and third order effects that might not have otherwise been uncovered, but that teams who have exercised together in any form of emergency are better placed to cope with the next one that comes along.”⁴⁸⁴

Airmic also noted the importance of exercising, writing that “an untested plan is doomed to fail”.⁴⁸⁵ However, exercising must be conducted in a high-quality manner to ensure it is effective in reaching its goals.

270. Witnesses set out a series of characteristics of high-quality exercising. Dr Karen Reddin noted that exercises should have a clear purpose and should

483 Written evidence from Thames Valley Local Resilience Forum ([RSK0082](#)); Written evidence from Devon, Cornwall and Isles of Scilly Local Resilience Forum ([RSK0036](#)); Written evidence from Mountain Rescue England and Wales ([RSK0018](#)); Written evidence from Resilience First ([RSK0015](#))

484 Written evidence from Athena ([RSK0049](#))

485 Written evidence from Airmic ([RSK0053](#))

be tailored to the maturity of the plans being tested, with more mature plans requiring more stretching exercises.⁴⁸⁶ Dr Schelhase highlighted the need to exercise to the point of failure and to exercise the unexpected, rather than just exercising scenarios only slightly beyond business as normal.⁴⁸⁷ Several witnesses emphasised the need to exercise a wide range of scenarios and warned against trying to learn general lessons from specific scenarios.⁴⁸⁸

271. Exercises help to build capabilities and practise roles. Several witnesses drew the Committee's attention to the importance of ensuring the correct level of participation in an exercise. John Thornhill highlighted the importance of the "top-level leadership" participating in exercises. This was "so that the top leadership are absolutely aware of what the issues are and that they are the ones who are prioritising the response."⁴⁸⁹ John Curry, Senior Lecturer in Games Development and Cyber Security at Bath Spa University, echoed this, suggesting that ministerial level involvement in exercises is key to their success and that "for plans to work the leaders need to have practised them".⁴⁹⁰ They suggested that short exercise or war-games would be better suited for senior leaders.⁴⁹¹ John Curry also noted the value of ensuring the participants of an exercise are as diverse as possible to get a wide variety of perspectives.⁴⁹²
272. Exercises and war-games are an opportunity for plans to be tested in a no consequence environment. The benefit of exercises is that inadequacies or errors can be identified in an exercise and corrected in advance of an emergency. Deborah Higgins said that exercises must take place in a safe place and that there must be "a culture of honesty and transparency in the organisation and among the team to allow for mistakes to be made. There must not be a fear of failure."⁴⁹³ Deborah Higgins also noted the importance of inviting challenge and including red-teaming in exercises "to challenge and to avoid the typical responses you might get if you are looking internally in an organisation".⁴⁹⁴ Red-teaming is the practice of rigorously challenging plans, policies, systems and assumptions by adopting an adversarial approach. A red team may be a contracted external party or an internal group which uses strategies to encourage a variety of perspectives.
273. Exercises present an excellent opportunity to study a response and identify where improvements could be made. Deborah Higgins identified this 'lessons learned' process as "the most critical part of exercising", saying "There is no point doing it if you are not going to then identify and follow up on the lessons".⁴⁹⁵ Both John Curry and Dr Karen Reddin emphasised the importance of a feedback loop, whereby the lessons learned from exercises inform both risk assessment and risk planning.⁴⁹⁶
274. However, in reality, lessons are often identified but not followed through on. Dr Reddin said:

486 [Q 176](#) (Dr Karen Reddin)

487 [Q 123](#) (Dr Schelhase)

488 [Q 37](#) (Professor Sir Mark Walport); [Q 157](#) (Professor Jim Hall); [Q 181](#) (Deborah Higgins)

489 [Q 43](#) (John Thornhill)

490 [Q 176](#) (John Curry)

491 [Q 176](#) (John Curry)

492 [Q 177](#) (John Curry)

493 [Q 176](#) (Deborah Higgins)

494 [Q 177](#) (Deborah Higgins)

495 [Q 178](#) (Deborah Higgins)

496 [Q 179-180](#)

“The lessons are often identified, a report is made and actions are identified to implement those lessons, but taking that forward is very difficult, because often there are competing priorities for different organisations following an exercise.”⁴⁹⁷

275. The frequency of exercising is important. While exercises should be frequent enough to ensure that skills remain sharp and plans are not out of date, exercises can be a significant time and resource drain. Witnesses suggested that there should be more frequent exercising, with Deborah Higgins recommending that there should be increased mandating of exercising in Government.⁴⁹⁸ Witnesses also suggested that the value placed in exercising differs significantly across Government, with the military placing a higher premium on exercising than the civil sphere.⁴⁹⁹ The frequency of exercising will depend on the nature of the risk, but it is clear that exercising should be more highly valued and undertaken more frequently, particularly by senior leaders.
276. **Exercising and wargaming should be at the heart of UK preparedness as they are crucial to ensure plans are tested and those responsible for executing them are well-trained. Exercises must be regular, short and involve the most senior figures responsible for the plans, including ministers. To challenge group-think, exercises should include red-teaming where appropriate. They should test a wide range of scenarios, including compound or cascade risks, and should be followed up on with lessons learned, which in turn should feed into a loop which informs both risk assessment and planning.**
277. *Risk plans must specify how frequently they are to be subjected to exercising or wargaming. The Government must ensure that these testing obligations are met. Exercises should abide by the principles laid out in paragraph 265. These exercises must include involvement by the most senior figures, senior officials and ministers. These exercises must be followed up with a thorough ‘lessons learned’ process, with these lessons learned published so they can be scrutinised. Scrutiny of lessons learned should be followed up on after one, two and five years.*

Local planning: information access and adequacy

278. Many risks are planned for and managed at a local level, a fact acknowledged by Roger Hargreaves when they said: “We are very clear that local responders are the foundation and building block of effective response, so we look to give them maximum support.”⁵⁰⁰ However, the evidence we received from LRFs indicates that they do not have access to the requisite information or correct resources to discharge this duty.
279. Work is undertaken nationally to plan for and mitigate against risks in the NSRA. Our witnesses noted that there is little value in LRFs duplicating this work. Instead, it would be more valuable to use limited resources to understand where LRFs could provide added value. Stuart Marshall said:

497 [Q 180](#) (Dr Karen Reddin)

498 [Q 180](#) (Dr Karen Reddin) [Q 179](#) (Deborah Higgins)

499 [Q 179](#) (John Curry)

500 [Q 12](#) (Roger Hargreaves)

“Give us the tool, we will put the quality of local knowledge into it, and then we can start to get something of real value out of it, rather than what at times feels like a list of things that could happen. I would rather have someone say, “These are the capabilities we require to mitigate against these risks”, but we are not currently resourced to undertake the work to that level.”⁵⁰¹

This sentiment was echoed by John Barradell who said:

“... it would be extremely helpful to understand the mitigations that central government is putting in place for the risks that it identifies. That would allow us to consider where, locally, we could add value, if I could put it that way, to mitigate the risks that are not being handled centrally.”⁵⁰²

280. This would require central government to put a greater emphasis on producing plans at a national level and cascading this information down to the local level. Chief Constable Swann noted that this would also ensure consistency of plans and provide assurance on the adequacy of planning arrangements.⁵⁰³
281. Planning for disruptive events requires LRFs to have access to information so that those plans can be as accurate and up-to-date as possible. However, our witnesses told us that the information they require is regularly not provided to them. Dr Twycross told us: “Frequently, when we are asked to plan, we do not necessarily have the information that government has access to. We think that LRFs, and partners within those partnerships, should be treated as trusted partners by government.”⁵⁰⁴ Dr Twycross noted that even the highest quality assessments and plans are of limited value if they are not shared with those responsible for enacting them, that “you are hampered even before you start the process.”⁵⁰⁵ John Barradell called for a statutory responsibility on government departments to share information with LRFs.⁵⁰⁶
282. We acknowledge that there are security concerns associated with the information held on malicious risks, and that it may not be feasible to share assessments and plans on these risks as widely. However, LRFs must still be able to plan for the consequences of these threats manifesting. Both Hampshire and Isle of Wight LRF and Thames Valley LRF called for sight of consequence management plans at an Official-Sensitive level.⁵⁰⁷
283. **The NSRA, as a list of risks, is insufficient for risk planning at a local level. LRF representatives called for greater sight of national plans and mitigations to allow them to identify where they could best add value. LRFs must have access to the information required to build planning assumptions, including the required capabilities to mitigate risks.**

501 [Q 223](#) (Stuart Marshall)

502 [Q 223](#) (John Barradell)

503 Written evidence from Rachel Swann (Chair at Derby and Derbyshire Local Resilience Forum) ([RSK0087](#))

504 [Q 223](#) (Dr Fiona Twycross)

505 [Q 223](#) (Dr Fiona Twycross)

506 [Q 226](#) (John Barradell)

507 Written evidence from Hampshire and Isle of Wight Local Resilience Forum, Hampshire County Council ([RSK0070](#)); Written evidence from Thames Valley Local Resilience Forum ([RSK0082](#))

284. *The Government must share all civil contingencies documentation with LRFs, except in cases where there is a national security reason to withhold information. In these cases where national security threat analyses are withheld, at a minimum, information must be given to LRFs to allow them to prepare for the consequences of the materialisation of national security threats. The national preparedness benchmark, developed by the Office for Preparedness and Resilience, should be shared with LRFs along with guidance on translating the specified capabilities and standards of preparation to the local level.*

Business and industry: planning and response

285. As discussed in Chapter 4, risk assessment and planning are a routine capability in the private sector. Indeed, we note that when compared to the Government, business and industry often has a much more dynamic approach to risk. This is shown through practices of regularly considering principal risks, setting risk appetites and creating risk frameworks.⁵⁰⁸ Eoin Murray, Head of Investment, Hermes Investment, told us that, in his view, “businesses and investors can learn as much from how government manages risk as vice versa”.⁵⁰⁹
286. When planning for risks, two-way conversations between business and industry and the Government allow for business and industry to understand any impacts they may incur or how they may be expected to act in a response, while also allowing the Government to understand business and industry capabilities. The value of these conversations was noted by Elisabeth Braw who suggested that: “You could, for example, also train or have regular consultations with business leaders, so that they would better understand the national security situation in which their companies operate.”⁵¹⁰
287. Ed Butler also spoke of the value of involving business and industry, alongside academia, in risk management, saying: “if you get the power of the three, of academia, government and business working together, whether it is for risk financing or engaging the capital markets to come and invest in risk mitigation and resilience measures, it is all in everyone’s interest.”⁵¹¹
288. From the evidence we received from business and industry leaders, it does not appear that these conversations are widespread. Leigh Pomlett told us:

“As an industry, we have no visibility of what the Government do in terms of risk management ... We do not have visibility of what the Government do in planning for these things. The industry has templates and methods for managing risk, which are probably just as useful to government officials as they are to industry leaders such as me.”⁵¹²

Dr Simon Harwood suggested that a fear of potential conflicts of interest may be to blame for the lack of engagement with business and industry, but noted that, “there has to be a better way of working together in the interests and protection of this country.”⁵¹³ Even in the cases where the Government does

508 [Q 163](#) (Dr Adam Marshall)

509 [Q 163](#) (Eoin Murray)

510 [Q 157](#) (Elisabeth Braw)

511 [Q 89](#) (Ed Butler)

512 [Q 163](#) (Leigh Pomlett)

513 [Q 90](#) (Dr Simon Harwood)

engage with business and industry, it appears to be done on a departmental basis. Information and insights gained through this engagement is not shared with other departments, leading to duplication of effort.⁵¹⁴

289. It is important that this engagement is not just instigated when a disruptive event occurs, and is well embedded during peace time also. Kate Nicholls said this was not always the case: “My observation would be that, once we get out of a crisis, everybody breathes a sigh of relief and that does not continue on an ongoing basis. We need to build it back into the system, to make sure that it is kept fresh, and the lessons are learned from it.”⁵¹⁵
290. **As is the case with risk assessment (see paragraphs 229 and 230), businesses and industry should play a more active role in the national planning process. Information on their levels of preparedness and ability to respond in a crisis is critical for the development of robust plans. Likewise, the Government should be clear about what the expectations may be on them in the event of a crisis. This two-way communication is in place at a local level, but at a national level it is limited. The forum we recommend in paragraph 230 would play a key role in facilitating this.**
291. Beyond direct engagement, there are more passive mechanisms the Government can use to inform business and industry about how it can manage in the event of a disruptive national hazard. Guidance published on GOV.UK provides a means for the Government to encourage business and industry to plan for major risks in the NSRA. However, much of this guidance has not been recently updated. As an example, the Government webpage outlining the guidance on Pandemic Flu was published in 2013.⁵¹⁶ It links to a ‘Pandemic flu checklist for businesses’ which was published in 2011.⁵¹⁷ The failure to update guidance was noted by Kate Nicholls who said:
- “There is government guidance to business on business resilience planning. That was last updated in 2015, so the Government have a role to make sure that, at the same time they are doing their national risk registers, they update their guidance to business to talk about what businesses should do for their own business resilience planning.”⁵¹⁸
- Guidance should be clearly labelled as such, to avoid confusion between guidance and requirements.
292. **Much of the guidance published on GOV.UK to help inform businesses planning for major disruptive events is out of date. This guidance is one means by which the Government can outline the expectations on industry and businesses. The Government should renew and streamline this information, and clarify what is a legal requirement and what is government guidance.**
293. ***The Government should commit to updating all resilience related guidance on GOV.UK to ensure it is accurate, clear and up to date.***

514 Q 166 (Kate Nicholls)

515 Q 167 (Kate Nicholls)

516 Cabinet Office, ‘Pandemic flu’: <https://www.gov.uk/guidance/pandemic-flu> [accessed 22 November 2021]

517 Cabinet Office, ‘Pandemic flu checklist for businesses’: <https://www.gov.uk/government/publications/pandemic-flu-checklist-for-businesses> [accessed 22 November 2021]

518 Q 166 (Kate Nicholls)

Box 11: Toddbrook Reservoir Case Study

During the course of our inquiry, we received evidence on the major incident at the Toddbrook Reservoir. This case study provides an example of how local responders manage risk and how ageing infrastructure can lead to serious damage. Chiefly it shows that risk planning must go beyond implementing regulations.

Between 27 July and 1 August 2019, a period of heavy rainfall caused a significant increase of water to flow into the Toddbrook dam. On 1 August, this increased water concentration triggered a partial collapse of the concrete slabs that formed the reservoir's spillway chute.⁵¹⁹ A complete breach of the slipway would have presented a grave threat to life for those in the town of Whaley Bridge.⁵²⁰ The partial collapse triggered a major emergency response. 1,500 people were temporarily evacuated from their homes in Whaley Bridge and water was drawn down from the reservoir to reduce the likelihood of collapse. Local and national agencies coordinated the response to the emergency. Following the reduction of the threat of collapse and flooding, it was deemed safe to allow residents to return to their homes on 7 August 2019.⁵²¹

UK Planning

The extreme rainfall which led to the collapse of the spillway was a rare occurrence. The second period of rainfall had an estimated annual probability of about 1%. However, the rain had been well forecast in advance.⁵²² More generally, the Government has long been aware of the significant risk posed by flooding. As previously mentioned in box 8, in the 2018 National Security Capability Review, the Government said: "One or more major hazards can be expected to materialise in the UK in every five-year period. The most serious are pandemic influenza, national blackout and severe flooding."⁵²³

Despite awareness of the risk, the incident at Toddbrook reservoir came as a surprise.⁵²⁴ Professor David Balmforth, former President of the Institution of Civil Engineers, who led the independent review into the Toddbrook incident told us: "That spillway should have been capable of handling a one-in-10,000-year flood. It failed during what was a little under a one-in-100-year flood event".⁵²⁵ Greater Manchester Combined Authority noted that while the risk posed by a reservoir flooding may be well known, the high cost of mitigation or wide range of impacts can lead to a lack of preparedness.⁵²⁶

519 Environment Agency, *Advice note following the Toddbrook reservoir incident* (August 2019) p 6: https://britishdams.org/assets/documents/News_Item_Docs/2020/200511 - EA Tech Bulletin/EA Technical Bulletin_Toddbrook review_190320_FINAL.pdf [accessed 30 November 2021]

520 Environment Agency, 'Looking back at Toddbrook twelve months on': <https://environmentagency.blog.gov.uk/2020/07/31/looking-back-at-toddbrook-twelve-months-on/> [accessed 30 November 2021]

521 'Whaley Bridge dam: Evacuated residents can return home', *BBC News* (7 August 2019): <https://www.bbc.co.uk/news/uk-england-derbyshire-49261977> [accessed 22 November 2021]

522 DEFRA, Toddbrook Reservoir Independent Review Report (February 2020) p 1: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/872769/toddbrook-reservoir-independent-review-reporta.pdf [accessed 30 November 2021]

523 Cabinet Office, *National Security Capability Review* (March 2018), para 9: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/705347/6.4391_CO_National-Security-Review_web.pdf [accessed 30 November 2021]

524 Q 56 (Professor David Balmforth)

525 Q 56 (Professor David Balmforth)

526 Written evidence from Greater Manchester Combined Authority ([RSK0072](#))

Safety and Compliance

The reservoir was fully compliant with legislation prior to the 2019 incident, raising concerns about the adequacy of current legislation.⁵²⁷ As Professor Balmforth concluded: “My conclusion was that the failure was due to both poor design and incomplete maintenance, but perhaps the most important lesson from that was that compliance with current legislation does not necessarily assure the safety of a reservoir.”⁵²⁸ This was acknowledged by both the Canal and River Trust and the Environment Agency who stated that compliance with statutory legislation is not the same as safety.⁵²⁹

The compliance of the Toddbrook gives further evidence to support the conclusion we draw in paragraph 88, on the degradation of critical national infrastructure (CNI). The Toddbrook Reservoir incident highlights the need to quantify the progress of infrastructure degradation and prioritise spending accordingly.

Government communication and powers

The local response to the Toddbrook incident was led by Chief Constable Rachel Swann. Chief Constable Swann praised support provided by central Government during the crisis, noting that government liaison officers “were vital in both passing the information through and passing back the support that was available to me in what is very complex machinery”.⁵³⁰ Government liaison officers provided Chief Constable Swann with information on the support and resources available from central Government.⁵³¹ The value of these liaison officers emphasises the importance of close working between central government and local responders, as noted in paragraphs 122 and 124.

Chief Constable Swann drew our attention to the failure to make use of emergency powers under the Civil Contingencies Act 2004. Part 2 of the Civil Contingencies Act permits the evacuation of citizens from an area of high threat to loss of life.⁵³² Evacuation was a core element of the emergency response, with approximately 1500 people evacuated from the downstream town of Whaley Bridge to reduce the impact of a potential dam failure.⁵³³ However, because the powers within the Act were not used, there were no legal powers to instruct that individuals leave their homes. A small number of individuals chose to remain, placing the responders who had to repeatedly ask them to leave at risk.⁵³⁴

527 Q 56 (Professor David Balmforth)

528 Q 56 (Professor David Balmforth)

529 DEFRA, *Toddbrook Reservoir Independent Review Report* (February 2020) p 3: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/872769/toddbrook-reservoir-independent-review-reporta.pdf [accessed 30 November 2021]

530 Q 224 (Chief Constable Rachel Swann)

531 Q 224 (Chief Constable Rachel Swann)

532 Civil Contingencies Act 2004, [section 22](#)

533 Environment Agency, *Advice note following the Toddbrook reservoir incident* (August 2019) p 6: https://britishdams.org/assets/documents/News_Item_Docs/2020/200511 - EA Tech Bulletin/EA Technical Bulletin Toddbrook review 190320 FINAL.pdf [accessed 30 November 2021]

534 Q 226 (Chief Constable Rachel Swann)

During the incident response, use was made of an off-site reservoir plan to manage the crisis. Chief Constable Swann described the value of this plan, which mapped where water would flow, who would need to be evacuated, what roads should be closed and what the rendezvous points would be. However, there is no requirement for off-site plans to be produced, it was fortuitous that Derbyshire LRF had directed some surplus funds into creating the off-site plans.⁵³⁵ Chief Constable Swann recommended mandating the creation of off-site reservoir plans, mirroring the statutory responsibilities already placed on Control of Major Hazard (COMAH) sites.

Lessons learned from the Toddbrook Reservoir case study

294. ***The off-site reservoir plan for Toddbrook Reservoir was invaluable during the emergency response to the 2019 incident. Off-site reservoir plans, such as had been voluntarily created for Toddbrook Reservoir prior to the 2019 incident, should be a statutory requirement for reservoirs.***

535 [Q 224](#) (Chief Constable Rachel Swann)

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Lessons to be learned from the climate change case study

1. Many of the risks facing the UK are likely to increase both in magnitude and frequency as a result of climate change, and risk assessment cannot be conducted without acknowledging this fact. Climate change is an ever more significant risk facing the UK and action to address it needs to be undertaken rapidly and as a priority. (Paragraph 13)

Chapter 3: Resilience

2. The central government risk assessment process has developed a culture of secrecy that impedes thorough scrutiny, expert consultation and information sharing with key partners. The Committee has seen the Official-Sensitive National Security Risk Assessment (NSRA) and believes that the secrecy surrounding the document is unwarranted and that much of this information does not need to be secret and should be in the public domain. As we discuss in paragraph 79, the Government should welcome greater external expertise and challenge into the process. This would allow the process to be more open to challenge and allow it to draw on independent scientific advice. (Paragraph 62)
3. The Government's risk assessment process should not shy away from politics, including in its content, by which we mean ministerial engagement, parliamentary scrutiny and participation by the devolved administrations. It should be driven by the UK's strategic priorities and needs greater ministerial oversight. (Paragraph 69)
4. *The Government should re-establish the Threats, Hazards, Resilience and Contingencies subcommittee of the National Security Council, or an equivalent Cabinet Committee, ahead of the production of the next National Security Risk Assessment. (Paragraph 70)*
5. *The Government should establish an Office for Preparedness and Resilience as a non-departmental body, headed by a newly created post of Government Chief Risk Officer. This body would be responsible for producing independent analysis of UK preparedness and monitoring Government preparedness. It would produce assessments of UK resilience, set resilience standards, and conduct audits of UK preparedness. It would have the ability to commission research and establish expert task and finish groups on specific topics to produce expert led reports and assessments. The Office for Preparedness and Resilience should have a standing expert advisory council to provide independent challenge, oversight and strategic direction. It should establish an institutional memory bank, in the form of a digital library, which contains resilience literature and the lessons learned of all major exercises and emergencies. This should be made available to a designated set of users including central Government officials, local responders, the devolved administrations, and parliamentarians. (Paragraph 79)*
6. The Government has a strong disincentive to invest against possible risks, but prevention is significantly cheaper than cure and a failure to invest in mitigation can cause an increase in likelihood and impact. Government spending should, where possible, be directed towards preventing or mitigating disaster. Business cases must represent the future benefits of preparedness and mitigation, as well as the costs. The discounting rates required by the Treasury's 'Green Book' favour short-term gains and are disincentivising risk

spending in risk management. Elements of critical national infrastructure (CNI) degrade over time, but this is not adequately accounted for within the current risk management system.(Paragraph 88)

7. *The Treasury and spending departments must move away from their current practice of disincentivising long-term, preventative spending on risk. To address this, the Government should establish a flexible and evidence-based spending target for spending on resilience. This funding target should be based on the required capabilities and proposed mitigations outlined by the new Office for Preparedness and Resilience which we have recommended in paragraph 79. This should be assisted by an appropriate depreciation register for Critical National Infrastructure which identifies ageing infrastructure. (Paragraph 89)*
8. Ensuring those responsible for the creation and execution of plans have the appropriate skills and qualities, including flexibility and adaptability, is vital for their success. This applies not just to the Government, but is a challenge for all of society. Within Government this includes ministers as well as officials. There should be a diverse range of individuals involved as diversity of background, thinking and approach are a benefit to resilience policymaking. We highlight the need for a greater focus within Government on analysis skills, emergency planning skills and project delivery skills in the civil sphere. The skills required are determined by the risk in question and change over time. An analysis of future skill requirements is needed to ensure that the Government has the rolling capability to deal with emerging threat scenarios. (Paragraph 98)
9. *The Government should bolster its skills base in the areas of analysis, emergency planning and project delivery and make more use of systems thinking and Futures techniques when conducting risk assessments and developing policy. This will require offering high quality, targeted training, skill-based allowances, defined career paths, and making use of the full breadth of pay bands where market needs justify this. In developing the requisite capabilities, the Government should ensure it builds and maintains staff diversity. There must be more ministerial engagement in risk preparedness. The Government should provide guidance and implement training for ministers on planning and crisis response. These skills should also be cultivated and properly organised in broader society to bolster general resilience. (Paragraph 99)*
10. Risks do not respect national borders. They are likely to have international impacts and will require international responses. UK risk planning needs to acknowledge how interconnected the world is and work internationally to plan for risk. Such engagement is an opportunity not only for the UK to pursue its policy agenda but also to learn from international partners. A strong UK involvement in international forums is necessary to mitigate against the risks faced by the UK and ensure risk planning considers international dimensions and is not narrowly focused on domestic issues. International agreements and research partnerships will be necessary to ensure some risks are mitigated effectively, for example the threat posed by Level 4 biolabs.(Paragraph 106)
11. *We are encouraged by the inclusion of global risks and international partnerships in the Government's call for evidence for The National Resilience Strategy. The Government must ensure that the strategy clearly outlines how it will engage in international forums and what international agreements it would like to see implemented and refreshed. It should clearly lay out what resource it will devote to*

these efforts and commit long term funding. In particular, the Research Councils should give additional focus to projects which explore the international dimensions of risks. The Government should work with international partners to establish a global surveillance scheme for disease and establish data sharing agreements to ensure new infectious diseases can be identified rapidly and information about them shared with ease.(Paragraph 107)

Chapter 4: A whole of society approach

12. LRFs currently do not have clarity about their purpose and expected duties. The expectations of LRFs have grown and shifted over time which has not been reflected in the Civil Contingencies Act, its associated regulations or guidance.(Paragraph 119)
13. *As part of the quinquennial review of the CCA regulations, due to report by March 2022, the Government should clarify the purpose and duties of the LRFs and should place them on a statutory footing. If LRFs are to take a more active role in emergency response, the training required, and possible liabilities increased by this change should be addressed. The UK Government in its review of the CCA should expand the range of named category 2 responders.*(Paragraph 120)
14. The UK's risk assessment system is too top-heavy. LRFs do not have sufficient contact with the CCS and are not viewed as trusted partners in the process. Information flow and communication is currently poor and the direction of information flow between national and local level is largely one-directional. A national system which cannot account for local knowledge is not good enough. There is a need to facilitate the sharing of expertise and information across LRFs. (Paragraph 124)
15. *The Government should improve its communication and engagement with local authorities and LRFs. In particular, the Government should establish a forum for the seamless sharing of information among LRFs, facilitated by central government. This forum would allow for the sharing of completed risk assessments and best practice insights both among LRFs and from LRFs to central government. This forum should meet at least twice yearly. It should be convened before the production of the NSRA to allow LRFs to contribute insights on the methodology and local risk information, and after the NSRA has been produced to allow LRFs to share local risk assessments and prevent duplication.*(Paragraph 125)
16. Expectations on Category 1 responders have increased since the CCA entered into law. The CCA was designed to respond to short-term emergencies, but the responsibilities placed on LRFs are now more in line with a resilience agenda. LRFs have become a default tasking mechanism for resilience policy at a local level. Whilst the obligations placed on LRFs have increased, local government budgets have been subjected to significant cuts. This has hampered their ability to undertake their statutory duties.(Paragraph 129)
17. *The Government should ensure the funds allocated to LRFs are appropriate and sufficient to allow them to carry out the full range of their responsibilities. Ring-fenced funding should be allocated to allow LRFs to operationalise the necessary capabilities and standards set out by the Government.* (Paragraph 130)
18. LRFs struggle to access relevant information to inform their risk assessments due to the current high levels of secrecy. This hampers local preparedness. LRFs also face duplicating work performed centrally or by other LRFs due to a lack of communication and coordination between groups, the lack

of a single risk assessment template, and the inability to copy and paste information on risks. There is a need to facilitate the sharing of expertise and information across LRFs. (Paragraph 134)

19. *LRFs should be engaged in the production of the NSRA through the forum described in paragraph 125. The CCS should commit to sharing information as a default with LRFs. Information on the consequences of security threats should be provided at a minimum. Wherever possible, to prevent duplication of effort, information should be produced once at a national level and cascaded down to a local level. The Government should produce a single risk assessment template for use by LRFs to limit the duplication of effort and should ensure that information on risks can be directly copied from the NSRA into the local risk assessment. (Paragraph 135)*
20. Engagement of the devolved administrations by the UK Government is superficial and ad-hoc and often an afterthought, particularly on reserved matters which may have implications for the resilience systems in the devolved administrations. Resilience is a devolved capability and as a consequence a more formalised engagement process is needed.(Paragraph 140)
21. *The UK Government needs to produce an agreed set of communications structures at all levels of seniority, including ministerial level, to facilitate effective resilience dialogue between central government and devolved administrations. This must be done in consultation with the devolved administrations. This should define the frequency and terms of engagement, at what stage the devolved administrations should be consulted and/or informed and identify key points of contact. (Paragraph 141)*
22. The COVID-19 pandemic has exposed the difficulties posed by the insurance industry in providing affordable cover for catastrophic or systemic risks. Rising premiums will impact insurance coverage and expose the Government to increased risk and damage national resilience. Public-private schemes, such as Pool Reinsurance, have helped to address market failures and distribute risk between the public and private sector.(Paragraph 147)
23. *The Government should work with the UK insurance industry to explore mechanisms which allow for the transfer, management and mitigation of risks which are too large for the private sector to address alone and for which the Government is the insurer of last resort, but may in fact find itself the insurer of first resort.(Paragraph 148)*
24. Regulation is crucial for bolstering national resilience, particularly for the critical national infrastructure sectors. While there is a need to balance resilience with the cost to the consumer, that trade off should not move too far away from resilience. Near-miss reporting is critical to ensure vulnerabilities are caught before they can lead to disaster. Cross regulator working is essential given the cross-sector implications of many risks and this can also help avoid siloes in business and industry. The UK Regulators Network is a valuable development in this regard.(Paragraph 153)
25. *A statutory duty should be placed on all public and private regulated bodies who operate critical national infrastructure to produce and publish an audited business continuity plan. We encourage Ofgem and BEIS to implement a requirement for the operators of essential services to notify regulators of near misses, with the publication of an annual summary of near miss events. (Paragraph 154)*
26. The voluntary sector is a rich source of information and assistance on risk and response at a local level. However, the obligation on Category 1 responders

to “have regard to the activities of voluntary organisations” is unclear and interpretations vary between LRFs.(Paragraph 158)

27. *The Government should clarify what “have regard to the activities of voluntary organisations” means and outline what best practice in voluntary sector engagement would look like through the production of improved guidance for LRFs. (Paragraph 159)*
28. *The proposed reservist cadre lacks ambition and is not in line with the views of the voluntary sector. The voluntary sector should be supported to organise existing voluntary forces into a response mechanism. The Government should map existing voluntary capability and use this as the basis of any response. There should be a central coordinating point for a national voluntary response, mapping capability regularly, directing volunteers to under resourced voluntary forces and facilitating better liaison amongst voluntary groups and between the sector and the Government. The Government should be prepared to pay volunteers for days of work missed through participation in any coordinated response to risk events. The Government should consider adding emergency response skills to the post-16 curriculum, with schools and further education colleges providing volunteering opportunities to students. (Paragraph 169)*
29. The UK population is not sufficiently encouraged to engage in emergency planning or build a level of personal preparedness. At present, the NRR is the primary tool for public education employed by the Government. This approach falls short and does not empower the public to make informed decisions about personal safety. There is little evidence to suggest that providing information leads to panic. Providing individuals with knowledge about how to respond in a crisis and guidance to help build personal preparedness will improve societal resilience. It should be recognised that socio-economic disparities threaten to undermine civilian resilience capability. Moreover, misinformation poses a direct risk to civil cohesion and resilience. This risk has been exacerbated by the growing influence of social media platforms. Misinformation should be identified, pre-empted and countered as early as possible. (Paragraph 186)
30. *The Government should commit to a biennial publication of a brochure on risk preparedness. This brochure should educate the public on general resilience principles, outline how individuals could improve their preparedness, provide guidance on what to do in an emergency, and signpost further information on resilience. This should be modelled on the Swedish brochure ‘If crisis or war comes’ and supplement the NRR. (Paragraph 187)*
31. *The Government should consider the organisation and provision of a residential, intensive course on national security, resilience and defence for rising leaders in the public and private sectors. The Government should lay a written statement on with the findings of its consideration in both Houses within 6 months of publication of this report.(Paragraph 188)*
32. In particular, Exercise Cygnus recommended the production of a “Pandemic Concept of Operations” to assist with operationalising the response to a pandemic by clarifying the role of organisations and the rules of engagement. Based on the evidence we have received about the decision making in Government at the outset of the pandemic, it appears that this was not properly implemented prior to the COVID-19 pandemic. During the early stages of COVID-19 there was significant confusion in decision-making which hampered the UK’s response.(Paragraph 191)

33. *A Pandemic Concept of Operations should be produced, as well as Concepts of Operations for other major risks, to ensure that the confusion surrounding governance does not arise in future crises.*(Paragraph 192)
34. The 2018 Biological Security Strategy was a welcome development but the Government's failure to implement it fully has rendered it ineffectual. The emergence of COVID-19 has demonstrated the importance of strengthening the UK's biological security. (Paragraph 194)
35. *The Biological Security Strategy needs to be renewed, refreshed and implemented, whilst also incorporating the lessons learned from COVID-19. At present, the non-implementation of the Strategy represents a significant gap in UK preparedness and should be rectified as a priority. The updated strategy should be published alongside an implementation plan so that its progress can be tracked. Time in both Houses should be devoted to a debate on the refreshed strategy.* (Paragraph 195)

Chapter 5: Risk Assessment

36. The current National Security Risk Assessment timescales and impact assessments are not suitable to address either high impact-low likelihood or chronic risk events. The two-year timeframe currently in place leads to an underappreciation of the risks associated with low-likelihood or chronic risks and will result in outdated assessments for risk areas with a high velocity of change. There is also a high degree of uncertainty associated with the reasonable worst-case scenario (RWCS) and likelihood calculations. The likelihood of many risks cannot be accurately quantified. The likelihood-impact matrix of the NSRA may be misleading and lead to a false sense of confidence. (Paragraph 222)
37. The NSRA must be produced with mitigation and response in mind. The methodology of the NSRA and the Lead Government Department principle favour the assessment of discrete risks. This is an ineffective strategy given the interconnected nature of many risks. Risks are currently grouped by thematic areas, but risks within a given thematic area may require very different responses. Risk planning should focus on the outcome rather than the specific risk, and the NSRA should facilitate this. The national planning assumptions are one means to understand the capabilities required to respond to a range of possible scenarios. (Paragraph 223)
38. The current format of the NSRA and NRR is too rigid. We believe that the current PDF format of the NSRA and NRR is difficult to navigate and may deter readers due to its cumbersome size. The NSRA is too long to be a useful document, and it increases in size with each successive iteration. Its purpose as a planning document is hampered by its attempts to be exhaustive. A shorter, more dynamic, web-based platform would facilitate access, make the underlying data more visible, and allow for the improved representation of interconnectedness. (Paragraph 224)
39. *We propose that instead of a simple risk assessment, the UK should produce a 'National Security Risk and Resilience Assessment'. This should place more emphasis on preparedness and resilience. The NSRA as a list of risks is of limited use and should be linked to emergency plans, simulations, capability development and proposed mitigations. This should be achieved through the following changes:* (Paragraph 225)

- *The NSRA must focus more on the outcomes of emergencies. The document should be oriented around common consequences to allow for preparedness efforts which are not overly focused on discrete risks. This should be supplemented by a smaller list of very high-consequence risks or risks for which specialised planning is required.*
 - *Risks should be grouped using Ortwin Renn's categories (box 9) to ensure risks which require similar responses are considered together. We accept that the labelling of these categories may need to change to avoid any confusion.*
 - *Risks should be assessed on an impact-vulnerability matrix, as well as an impact-likelihood matrix.*
 - *Where a risk may manifest in a number of ways, the NSRA should present several scenarios, not just the Reasonable Worst Case Scenario.*
 - *The NSRA should include a number of cascading risk scenarios, whose development has been informed by interdependent infrastructure modelling.*
 - *The NSRA should move to a five-year timeline, with risks refreshed and reassessed annually. Risks which are identified as having a high velocity of change should be assessed more regularly. Chronic risks, chronologically unpredictable risks, low-likelihood risks and the most significant risks should also be accompanied by a long-term assessment of 15 years.*
 - *The Government should act under a presumption of publication, and should publish the content of the Official-Sensitive National Security Risk Assessment except where there is a direct national security risk.*
 - *The data required for emergency response should be identified at the point that a risk is assessed, and all efforts should be made to ensure that data can be accessed from the outset of a crisis.*
 - *The NSRA and NRR should be presented in a more dynamic, data driven web-portal which allows users to visualise the risk summary, access the underlying data and easily navigate to related risks.*
40. The inclusion of industry and businesses in the production of the NSRA is necessary to ensure that information on business and industry capabilities is correct and up to date. This would also allow the Government to inform business and industry of the likely impact on their sectors of the realisation of any risks in the NSRA. Trade associations and professional bodies represent a good level at which to conduct these meetings. Conversely, the Government should draw on the expertise within business and industry to ensure the creation of the NSRA and NRR is driven by best practice. The Government should elicit information on risk assessment methodologies and modelling capabilities, particularly from the insurance sector, critical infrastructure and safety-critical industries. (Paragraph 230)
41. *The Government should establish a forum, made up of representatives of trade associations and professional bodies, which should meet in advance of and following the production of the NSRA or twice a year, whichever is more frequent. After five years, the Forum could then meet once a year. This body should be convened by the Office for Preparedness and Resilience and used to ascertain information about business sector capabilities, inform business and industry of risks which may require a response on their part, and allow the Government to seek out best*

practice. Attention should be paid to ensuring representation from the full breadth of UK business and industry, with a particular focus on the logistics sector. The Government should deliver annual presentations on realistic risk assessment and risk planning to business and industry bodies. (Paragraph 231)

42. The Government should recognise that voluntary organisations often operate to professional standards of delivery and have unparalleled depth of practical and local knowledge. (Paragraph 235)
43. *At a national level, the Government should involve major voluntary organisations in the production of the NSRA. This is to ensure that the knowledge they possess on risks and levels of community resilience, as well as information on their operational capabilities, can be included. The Government needs to recognise that the voluntary sector possesses many skills that will be crucial to building societal resilience. This should be facilitated through the single point of contact we recommended in Chapter 4. (Paragraph 236)*
44. We believe that voluntary and community organisations represent an appropriate level at which to undertake engagement, particularly as it would allow the Government to target support towards vulnerable or at-risk groups. We also consider that Parliament offers a means of indirect engagement between the public and Government. (Paragraph 243)
45. The Government must recognise that informing the public about the risks they face is both morally justified and benefits societal resilience. Knowledge on how the public understands risk and the population's level of resilience is crucial to the development of rigorous risk assessment and planning. Voluntary and community groups can provide key insights on these issues. There needs to be a new culture within Government which recognises that not shielding the population, and instead providing information on risks, will lead to a more cohesive risk response. Better publicity of the NRR is essential to ensure that the public are aware of the risks that they may face and to outline the expectations on them in any risk scenario. This will require a re-consideration of the format of the NRR. (Paragraph 247)
46. *The NRR should, in line with the NSRA, be presented via a dynamic, data driven web-portal which is easily navigated, evolves in response to identified threats and which provides practical, targeted advice to individuals. Its profile must be increased through an active and continuing media campaign, including via social media. This campaign should heighten whenever substantive changes are made to the risk register. It should focus on informing society of the content of the NRR and how they could use the NRR to bolster their personal preparedness. (Paragraph 248)*
47. *When conducting the national risk assessment process, the Government should engage with voluntary and community groups to ascertain information on risks and population level resilience. (Paragraph 249)*

Chapter 6: Risk Planning

48. Preparedness and planning for risks in the National Security Risk Assessment (NSRA) should cover all possible impacts of a risk and must aim for mitigation or prevention where possible. Within the national security, defence and critical national infrastructure communities there is a strong emphasis on prevention, which should be replicated in all areas. There is currently an excess of siloed planning and a failure by departments to plan for risks for which they are not the LGD. This creates significant vulnerabilities.

The CCS currently do not have sufficient power to compel departments to work together or to compel preparation on specific risk areas. More cross-departmental working is needed, and departments must plan for all risks which may affect them, not simply those for which they are nominally responsible. There is, overall, an absence of auditing of departmental risk planning at all levels. In particular, the Committee recognises that Parliament has been too passive in its responsibility to scrutinise risk plans and should assist the audit of Government preparedness. (Paragraph 265)

49. *Central government risk planning should be benchmarked against the National Security Risk Assessment (NSRA), with standards of preparation and required capabilities set by the Office for Preparedness and Resilience (see paragraph 79). The CCS should convene cross-departmental working groups to address the most significant cross-cutting risks and to ensure that risk scenarios that cross departmental boundaries have risk plans that cover the full spectrum of possible impacts. These risks should be considered discretely by the Threats, Hazards, Resilience and Contingencies subcommittee of the National Security Council to ensure that there is ministerial discussion of these risks. (Paragraph 266)*
50. *A yearly debate on the National Security Risk Assessment (NSRA) should be held by both Houses of Parliament. To ensure more in-depth scrutiny, the Office for Preparedness and Resilience should audit departmental preparedness and conduct deep dives into departmental risk management. These audits should be based on the standards of preparation and required capabilities as set out by the Office for Preparedness and Resilience, with annual reports signed off by ministers and laid before Parliament for debate. They should investigate where there has been a failure to invest in preparedness, and conduct assessments of the cost of such failures. A new Joint Select Committee should be created to scrutinise and democratise the UK's risk planning approach and the work of the CCS. The Committee propose that this should be called the Joint Resilience and Contingencies Select Committee and should have access to all relevant information, including the NSRA. The National Audit Office has the power to investigate the Government's risk preparedness through the lens of public spending. The NAO should continue its valuable work scrutinising risk management in Government. (Paragraph 267)*
51. *The Government should change the name of the Civil Contingencies Secretariat in acknowledgement that the secretariat no longer manages civil emergencies alone. A name should be chosen which reflects its broad portfolio of threats and hazards. The Committee recommend the use of the 'Resilience and Contingencies Secretariat'. (Paragraph 268)*
52. *Exercising and wargaming should be at the heart of UK preparedness as they are crucial to ensure plans are tested and those responsible for executing them are well-trained. Exercises must be regular, short and involve the most senior figures responsible for the plans, including ministers. To challenge group-think, exercises should include red-teaming where appropriate. They should test a wide range of scenarios, including compound or cascade risks, and should be followed up on with lessons learned, which in turn should feed into a loop which informs both risk assessment and planning. (Paragraph 276)*
53. *Risk plans must specify how frequently they are to be subjected to exercising or wargaming. The Government must ensure that these testing obligations are met. Exercises should abide by the principles laid out in paragraph 265. These exercises must include involvement by the most senior figures, senior officials and ministers.*

These exercises must be followed up with a thorough 'lessons learned' process, with these lessons learned published so they can be scrutinised. Scrutiny of lessons learned should be followed up on after one, two and five years. (Paragraph 277)

54. The NSRA, as a list of risks, is insufficient for risk planning at a local level. LRF representatives called for greater sight of national plans and mitigations to allow them to identify where they could best add value. LRFs must have access to the information required to build planning assumptions, including the required capabilities to mitigate risks. (Paragraph 283)
55. *The Government must share all civil contingencies documentation with LRFs, except in cases where there is a national security reason to withhold information. In these cases where national security threat analyses are withheld, at a minimum, information must be given to LRFs to allow them to prepare for the consequences of the materialisation of national security threats. The national preparedness benchmark, developed by the Office for Preparedness and Resilience, should be shared with LRFs along with guidance on translating the specified capabilities and standards of preparation to the local level. (Paragraph 284)*
56. As is the case with risk assessment (see paragraphs 229 and 230), businesses and industry should play a more active role in the national planning process. Information on their levels of preparedness and ability to respond in a crisis is critical for the development of robust plans. Likewise, the Government should be clear about what the expectations may be on them in the event of a crisis. This two-way communication is in place at a local level, but at a national level it is limited. The forum we recommend in paragraph 230 would play a key role in facilitating this. (Paragraph 290)
57. Much of the guidance published on GOV.UK to help inform businesses planning for major disruptive events is out of date. This guidance is one means by which the Government can outline the expectations on industry and businesses. The Government should renew and streamline this information, and clarify what is a legal requirement and what is government guidance. (Paragraph 292)
58. *The Government should commit to updating all resilience related guidance on GOV.UK to ensure it is accurate, clear and up to date. (Paragraph 293)*
59. *The off-site reservoir plan for Toddbrook Reservoir was invaluable during the emergency response to the 2019 incident. Off-site reservoir plans, such as had been voluntarily created for Toddbrook Reservoir prior to the 2019 incident, should be a statutory requirement for reservoirs. (Paragraph 294)*

APPENDIX 1: LIST OF MEMBERS AND DECLARATIONS OF INTEREST

Members

Lord Arbuthnot of Edrom (Chair)
 Lord Browne of Ladyton
 Lord Clement-Jones CBE
 Lord Mair CBE
 Baroness McGregor-Smith CBE
 Lord O'Shaughnessy
 Lord Rees of Ludlow OM
 Lord Robertson of Port Ellen KT
 Baroness Symons of Vernham Dean
 Viscount Thurso
 Lord Triesman
 Lord Willetts

Declarations of interest

Lord Arbuthnot of Edrom (Chairman)
Chair, Advisory Panel (formerly Advisory Board), Thales Group UK (aerospace, defence, security)
Member, Advisory Board, Montrose Associates (strategic intelligence and advice)
Fee received from Swiss Government for moderating discussion on Cyber Security at request of Swiss Embassy, 11 October 2021 (the member's earnings for this work fell within the £0 - £5,000 band)
Member, Board of Advisers of The Electric Infrastructure Security (EIS) Council (protection against severe geomagnetic storms and electromagnetic pulse (EMP) risks) (some travel and accommodation expenses covered)
Chairman, Information Assurance Advisory Council (brings together public, private and other sectors to discuss and research strategic level information assurance issues)
Chairman and Trustee, Airey Neave Trust

Lord Browne Of Ladyton
Visiting Researcher at the Centre for the Study of Existential Risk (CSER)
Vice-chair of the Nuclear Threat Initiative (NTI)

Lord Clement-Jones CBE
Chair, Ombudsman Services Limited
Chair, Council of Queen Mary University of London (unpaid)
Consultant to DLA Piper LLP UK
Member of Advisory Board of Airmic (Association of Insurance and Risk Managers in Industry and Commerce) (unpaid)

Lord Mair CBE
Emeritus Professor of Civil Engineering, Director of Research, University of Cambridge Fellow, Royal Academy of Engineering
Fellow, Royal Society
Partner and consultant, Geotechnical Consulting Group (consulting engineers)
Non-executive Director and Chair of Board, Epsimon Ltd (infrastructure monitoring)
Consultant to the Laing O'Rourke Group (construction company)
Member of Independent Tunnelling Expert Panel advising Department of Transport and HS2 Ltd on HS2 design and construction

Member of the Committee on Climate Change Risk Assessment Expert Advisory Panel

Baroness McGregor-Smith CBE

Non-Executive Chair of Airports Operators Association (AOA)

Non - executive director of the Tideway tunnel, Bazalgette Finance Limited

Non - executive director, Department of Education

Senior independent adviser to Mace Group Limited

President, British Chambers of Commerce

Lord O'Shaughnessy

Vice-Chair, All Party Parliamentary Group on Longevity

Visiting Professor, Institute for Global Health Innovation, Imperial College London

Lord Rees of Ludlow OM

Involvement in research relevant to inquiry at CSER (Centre for the Study of Existential Risk) and the Royal Society

Lord Robertson of Port Ellen KT

Senior Counsellor, The Cohen Group (Washington DC, USA)

Chair, (Non-Executive) Western Ferries (Clyde) Ltd.

Member, International Advisory Board (Bahrain), Equilibrium Gulf

Special Adviser, BP plc

Special Adviser, Dial Partners LLC, (corporate finance and strategic advisory firm)

Vice Chair, Royal Edinburgh Military Tattoo

Elder Brother and member of Court, Trinity House

Visiting Professor. Kings College, London

Visiting Professor, University of Stirling

Baroness Symons of Vernham Dean

Chair, British Egyptian Society

Board member, British University in Egypt

Chair, Arab-British Chamber of Commerce

Chair, Saudi British Joint Business Council

Adviser to the DLA legal partnership

Fellow, Girton College, Cambridge

Viscount Thurso

No relevant interests declared.

Lord Triesman

Board Member, Salamanca Group Merchant Bank

Board Member, The European Leadership Network

Board Member, The Clean Growth Leadership Network

Board Member and Chair, BioFarma Innovation (UK and Irish Republic)

Visiting Researcher, Centre for the Study of Existential Risk, University of Cambridge

Chair, Appointments Panel, Independent Press Standards Organisation

Fellow, Royal Statistical Society

Lord Willetts

Board Member, UKRI

Board Member, Surrey Satellites

Non-executive Director, Darktrace (appointed 1 April 2021)

In process of setting up a venture capital fund investing in the eight great technologies including synthetic biology

Specialist adviser

Professor David Alexander

Professor (Grade 3) of Risk and Disaster Reduction at University College London

Editor-in-Chief of the International Journal of Disaster Risk Reduction, published by Elsevier

Vice-President and Chair of the Trustees, Institute of Civil Protection and Emergency Management (a registered charity)

Member of the London Resilience Academic Liaison Panel (currently dormant: London Resilience is a public body under the Mayor of London)

A full list of Members' interests can be found in the Register of Lords Interests: <https://www.parliament.uk/hlregister>

APPENDIX 2: LIST OF WITNESSES

Evidence is published online at <https://committees.parliament.uk/committee/483/risk-assessment-and-risk-planning-committee/publications/> and available for inspection at the Parliamentary Archives (020 7219 3074). Evidence received by the Committee is listed below in chronological order of oral evidence session and in alphabetical order. Those witnesses marked with ** gave both oral evidence and written evidence. Those marked with * gave oral evidence and did not submit any written evidence. All other witnesses submitted written evidence only.

Oral evidence in chronological order

*	Roger Hargreaves, Director, Civil Contingencies Secretariat	QQ 1-14
*	Professor David Alexander, Professor of Risk and Disaster Reduction, Institute for Risk & Disaster Reduction, University College London	QQ 15-27
*	Dr Piers Millett, Senior Research Fellow, Future of Humanity Institute	
*	Professor Ortwin Renn, Scientific Director, Institute for Advanced Sustainability Studies	
*	Professor Sir John Beddington, Former Government Chief Scientific Adviser	QQ 28-41
*	Professor Sir Mark Walport, Former Government Chief Scientific Adviser	
*	Dr Simon Beard, Academic Programme Manager and Senior Research Associate, Centre for the Study of Existential Risk, University of Cambridge	QQ 42-52
*	Dr Stephen Cave, Executive Director, Leverhulme Centre for the Future of Intelligence, University of Cambridge	
*	Caroline Gorski, Director, R2 Data Labs, Rolls-Royce	
*	John Thornhill, Innovation Editor, Financial Times	
*	Catherine Wright, Interim Executive Director of Flood and Coastal Risk Management, Environment Agency	QQ 53-60
*	Laura Hughes, General Insurance Policy Manager and Flood Policy Lead, Association of British Insurers	
*	Professor David Balmforth, Past President, Institution of Civil Engineers	
*	Andy Bord, Chief Executive, Flood Re.	
*	Ian Lisk, Chair, Natural Hazards Partnership	QQ 61-70
*	The Lord Ricketts GCMG GCVO, former National Security Adviser	QQ 71- 81
*	Ed Butler, Chief Resilience Officer, Pool Reinsurance	QQ 82- 91
*	Suzanne Raine, Affiliated Lecturer, POLIS, University of Cambridge	

- ★ Dr Simon Harwood, Director of Defence and Security, Cranfield University
- ★ Dr David Blagden, Senior Lecturer in International Security, University of Exeter
- ★ Dr Cassidy Nelson, Co-Lead of the Biosecurity Research Group at the Future of Humanity Institute, University of Oxford [QQ 92-105](#)
- ★ Dr Opi Outhwaite, Senior Lecturer in Law, St Mary's University
- ★ Dr Catherine Rhodes, Senior Research Associate of the Biosecurity Research Initiative, St Catharine's College, Cambridge
- ★ Bruce Carnegie-Brown, Chairman, Lloyd's of London [QQ 106-119](#)
- ★ Julian Enoizi, Chief Executive, Pool Re
- ★ Huw Evans, Director General, Association of British Insurers
- ★ John Scott, Head of Sustainability Risk, Zurich Insurance Group
- ★ Professor Paula Jarzabkowski, Professor of Strategic Management, City's Business School, City, University of London.
- ★ Lord Houghton of Richmond, Former Chief of Defence Staff of the British Armed Forces (2013–16) [QQ 120-130](#)
- ★ Sir Chris Deverell, Former Commander of the Joint Forces Command (2016–19)
- ★ Dr Marc Schelhase, Lecturer, Defence Studies Department, King's College London at the Joint Services Command and Staff College, UK Defence Academy
- ★ Dame Sue Ion, Honorary President, National Skills Academy for Nuclear [QQ 131-139](#)
- ★ Professor Stephen Richardson, Emeritus Professor of Chemical Engineering, Imperial College
- ★ Dr Tim Stone, Chairman, Nuclear Industry Association [QQ 140-146](#)
- ★ Will Webster, Energy Policy Manager, Oil and Gas UK
- ★ Lindsey Fussell, Group Director for Networks and Communications, Ofcom [QQ 147-154](#)
- ★ Cathryn Scott, Director, Enforcement and Emerging Issues, Ofgem
- ★ Chris Train OBE, Former CEO, Cadent
- ★ Elisabeth Braw, Visiting Fellow, American Enterprise Institute [QQ 155- 162](#)

- ★ Professor Jim Hall, Professor of Climate and Environmental Risks, University of Oxford
- ★ Professor Tim Watson, Director of the Cyber Security Centre, Warwick Manufacturing Group, University of Warwick
- ★ Eoin Murray, Head of Investment, Hermes Investment [QQ 163-175](#)
- ★ Joanne Holden, Chief Investment Officer UK, Mercer
- ★ Kate Nicholls, CEO, UKHospitality
- ★ Leigh Pomlett, President, Logistics UK
- ★ Dr Adam Marshall, Director-General, British Chambers of Commerce
- ★ John Curry, Senior Lecturer in Creative Computing, Bath Spa University [QQ 176-182](#)
- ★ Deborah Higgins, Head of the Emergency Planning College
- ★ Dr Karen Reddin, Senior Lecturer in Disaster Management, Bournemouth University
- ★ Major General Charles Stickland, Assistant Chief of the Defence Staff (Operations and Commitments), Ministry of Defence [QQ 183-192](#)
- ★ Paul Wyatt, Director of National Security, Ministry of Defence
- ★ Professor Alexander Fekete, Institute of Rescue Engineering and Civil Protection, Technical University of Cologne [QQ 193-206](#)
- ★ Peter Ho, Senior Adviser, Centre for Strategic Futures, Prime Minister's Office, Singapore
- ★ Jim Kronhamn, Acting Head of the Research and Evaluation Section, Swedish Civil Contingencies Agency
- ★ Harold van Waveren, Chair, National Crisis Team for Flood Risk, Rijkswaterstaat
- ★ Professor Brooke Rogers OBE, Professor of Behavioural Science and Security, Department of War Studies, King's College London [QQ 207- 213](#)
- ★ Professor Duncan Shaw, Professor of Operational Research and Critical Systems, University of Manchester
- ★ Dr Carina Fearnley, Associate Professor, Science and Technology Studies Department, and Director, UCL Early Warning Centre, University College London
- ★ Professor Sir David Spiegelhalter, Winton Professor of the Public Understanding of Risk, Statistical Laboratory, University of Cambridge

- ★ Charlotte Pickles, Director, Reform [QQ 214-221](#)
- ★ Professor Siân Griffiths OBE, Emeritus Professor of Public Health, Chinese University of Hong Kong
- ★ Alex Thomas, Programme Director, Institute for Government
- ★ Dr Fiona Twycross, Deputy Mayor for Fire and Resilience and Chair, London Resilience Forum [QQ 222-227](#)
- ★ John Barradell OBE, Chief Executive, City of London Corporation and Deputy Chair, London Resilience Forum
- ★ Stuart Marshall, Chief Emergency Planning Officer and LRF Manager, Cleveland Local Resilience Forum
- ★ Chief Constable Rachel Swann, Chief Constable, Derbyshire Constabulary, and Chair, Derbyshire Local Resilience Forum
- ★ Alistair Read, National Training Officer at Mountain Rescue England and Wales [QQ 228-234](#)
- ★ Lynda Battarbee, Director of Operations at the Trussell Trust
- ★ Richard Lee MBE, Chief Operating Officer at St John Ambulance
- ★ Adrian Clee, Emergency Response Lead at Salvation Army
- ★ Professor Brian Collins, Vice-Chair, National Preparedness Commission [QQ 235-241](#)
- ★ Lord Harris of Haringey, Chair, National Preparedness Committee
- ★ Robert Harris, Author [QQ 242-249](#)
- ★ Adrian Tchaikovsky, Author
- ★ Peter F Hamilton, Author
- ★ Dame Margaret Beckett MP, Chair, Joint Committee on the National Security Strategy [QQ 250-261](#)
- ★ Sir Oliver Letwin, Former Chancellor of the Duchy of Lancaster
- ★ Lord O'Donnell, Former Cabinet Secretary
- ★ Rt Hon. Penny Mordaunt MP, Paymaster General [QQ 262- 274](#)
- ★ Roger Hargreaves, Director, Civil Contingencies Secretariat
- ★ Reg Kilpatrick, Director-General of Covid-19 Crisis Co-ordination, Welsh Government [QQ 275-282](#)
- ★ Karen Pearson, Deputy Secretary for Civil Contingencies and Covid-19 Recovery, The Executive Office, Northern Ireland

- * Shirley Rogers, Director Organisational Readiness, Scottish Government
- * Sir Patrick Vallance, Government Chief Scientific Adviser [QQ 283-290](#)
- * Professor Gideon Henderson, Chief Scientific Adviser, Department for Environment, Food and Rural Affairs
- * Professor Charlotte Watts, Chief Scientific Adviser, Foreign, Commonwealth and Development Office

Alphabetical list of all witnesses

- The Adaptation Committee of the Committee on Climate Change [RSK0065](#)
- Airbus [RSK0062](#)
- Airmic [RSK0053](#)
- ALARM [RSK0079](#)
- Aldermaston Women's Peace Camp(aign) [RSK0022](#)
- * Professor David Alexander, Professor of Risk and Disaster Reduction, Institute for Risk & Disaster Reduction, University College London
- Amentum [RSK0086](#)
- Anonymous RSK 1 [RSK0073](#)
- Professor Willy Aspinall CMG [RSK0019](#)
- * Professor David Balmforth, Past President, Institution of Civil Engineers
- * John Barradell OBE, Chief Executive, City of London Corporation and Deputy Chair, London Resilience Forum
- * Lynda Battarbee, Director of Operations at the Trussell Trust
- * Andy Bord, Chief Executive, Flood Re.
- Brendan Aston [RSK0047](#)
- Athena [RSK0049](#)
- Dr Jennifer Bealt, The University of Manchester [RSK0068](#)
- * Dr Simon Beard, Academic Programme Manager and Senior Research Associate, Centre for the Study of Existential Risk, University of Cambridge
- * Dame Margaret Beckett MP, Chair, Joint Committee on the National Security Strategy
- * Professor Sir John Beddington, Former Government Chief Scientific Adviser
- Biosecu.re [RSK0043](#)

	Biosecurity Research Initiative at St Catharine's (BioRISC)	<u>RSK0040</u>
★	Dr David Blagden, Senior Lecturer in International Security, University of Exeter	
	Dr Andrew Blick	<u>RSK0098</u>
	Dr Edoardo Borgomeo	<u>RSK0052</u>
★	Elisabeth Braw, Visiting Fellow, American Enterprise Institute	
	British Geological Survey	<u>RSK0066</u>
	British Red Cross	<u>RSK0077</u>
	Professor Mark Burgman	<u>RSK0012</u>
	Helen Burton	<u>RSK0078</u>
★	Ed Butler, Chief Resilience Officer, Pool Reinsurance	
★	Bruce Carnegie-Brown, Chairman, Lloyd's of London	
★	Dr Stephen Cave, Executive Director, Leverhulme Centre for the Future of Intelligence, University of Cambridge	
	Centre for the Study of Existential Risk	<u>RSK0063</u>
★	Adrian Clee, Emergency Response Lead at Salvation Army	
	Dr Chris Cocking	<u>RSK0025</u>
★	Professor Brian Collins, Vice-Chair, National Preparedness Commission	
★	John Curry, Senior Lecturer in Creative Computing, Bath Spa University	
	Dr Hugh Deeming	<u>RSK0083</u>
★	Sir Chris Deverell, Former Commander of the Joint Forces Command (2016–19)	
	Devon, Cornwall and Isles of Scilly Local Resilience Forum	<u>RSK0036</u>
	Professor Clive Dyer	<u>RSK0044</u>
	Electricity Infrastructure Security Council	<u>RSK0099</u>
	Emergency Planning Society (EPS)	<u>RSK0088</u>
	The England & Wales Wildfire Forum (EWWF)	<u>RSK0039</u>
	Esther Eidinow	<u>RSK0035</u>
★★	CEO Julian Enoizi, Pool Re	<u>RSK0090</u>
★	Huw Evans, Director General, Association of British Insurers	
	Faculty of Public Health	<u>RSK0041</u>

- Jon Fassbender [RSK0034](#)
- * Dr Carina Fearnley, Associate Professor, Science and Technology Studies Department, and Director, UCL Early
- * Professor Alexander Fekete, Institute of Rescue Engineering and Civil Protection, Technical University of Cologne
- Fire Industry Association [RSK0029](#)
- Dr Alexandra Freeman [RSK0057](#)
- * Lindsey Fussell, Group Director for Networks and Communications, Ofcom
- * Professor Siân Griffiths OBE, Emeritus Professor of Public Health, Chinese University of Hong Kong
- * Caroline Gorski, Director, R2 Data Labs, Rolls-Royce Greater Manchester Combined Authority [RSK0072](#)
- ** Professor Jim Hall, Professor of Climate and Environmental Risks, University of Oxford [RSK0052](#)
- * Peter F Hamilton, Author
- Hampshire and Isle of Wight Local Resilience Forum, Hampshire County Council [RSK0070](#)
- * Roger Hargreaves, Director, Civil Contingencies Secretariat
- * Lord Harris of Haringey, Chair, National Preparedness Committee
- * Robert Harris, Author
- ** Dr Simon Harwood Director of Defence and Security, Cranfield University [RSK0005](#)
- * Professor Gideon Henderson, Chief Scientific Adviser, Department for Environment, Food and Rural Affairs
- * Deborah Higgins, Head of the Emergency Planning College
- Sam Hilton [RSK0092](#)
- Parents concerned about Hinkley [RSK0007](#)
- * Peter Ho, Senior Adviser, Centre for Strategic Futures, Prime Minister's Office, Singapore
- * Joanne Holden, Chief Investment Officer UK, Mercer
- Michael Holding [RSK0001](#)
- * Lord Houghton of Richmond, Former Chief of Defence Staff of the British Armed Forces (2013–16)
- * Laura Hughes, General Insurance Policy Manager and Flood Policy Lead, Association of British Insurers

	The Human Ai Institute	<u>RSK0089</u>
	Professor Bridget Hutter	<u>RSK0042</u>
	Institute of Risk Management	<u>RSK0055</u>
*	Dame Sue Ion, Honorary President, National Skills Academy for Nuclear	
*	Professor Paula Jarzabkowski, Professor of Strategic Management, City's Business School, City, University of London	
	Dr. Caroline Kamau	<u>RSK0037</u>
*	Reg Kilpatrick, Director-General of Covid-19 Crisis Co-ordination, Welsh Government	
	Dr Elco Koks	<u>RSK0052</u>
*	Jim Kronhamn, Acting Head of the Research and Evaluation Section, Swedish Civil Contingencies Agency	
*	Richard Lee MBE, Chief Operating Officer at St John Ambulance	
*	Sir Oliver Letwin, Former Chancellor of the Duchy of Lancaster	
	Debbie Lewis	<u>RSK0021</u>
	Dr. Gregory Lewis	<u>RSK0045</u>
	Matthew Gah-Kai Leung	<u>RSK0069</u>
*	Ian Lisk, Chair, Natural Hazards Partnership	
	Ian Longhurst	<u>RSK0027</u>
	Low Level Radiation Campaign	<u>RSK0050</u>
	Dr Kristen MacAskill	<u>RSK0046</u>
*	Dr Adam Marshall, Director-General, British Chambers of Commerce	
*	Stuart Marshall, Chief Emergency Planning Officer and LRF Manager, Cleveland Local Resilience Forum	
	Murray McMonies	<u>RSK0080</u>
*	Dr Piers Millett, Senior Research Fellow, Future of Humanity Institute	
	Professor Rebecca Moosavian	<u>RSK0098</u>
*	Rt Hon. Penny Mordaunt MP, Paymaster General	
	Mountain Rescue England and Wales	<u>RSK0018</u>
*	Eoin Murray, Head of Investment, Hermes Investment	
	National Centre for Resilience (NCR)	<u>RSK0085</u>

- ★★ Dr. Cassidy Nelson, Co-Lead of the Biosecurity Research Group at the Future of Humanity Institute, University of Oxford [RSK0045](#)

Netflix [RSK0097](#)
- ★ Kate Nicholls, CEO, UKHospitality

Nottingham Trent University, Richard Pickford et al [RSK0093](#)
- ★ Lord O'Donnell, Former Cabinet Secretary

Marie Oldfield [RSK0080](#)

ONR-NGO groups [RSK0096](#)

Dr Toby Ord, Senior Research Fellow at Future of Humanity Institute, Oxford University [RSK0033](#)

Dr Ed Oughton [RSK0052](#)
- ★ Dr Opi Outhwaite, Senior Lecturer in Law, St Mary's University

Dr Raghav Pant [RSK0052](#)

Rowland Pantling [RSK0009](#)
- ★ Karen Pearson, Deputy Secretary for Civil Contingencies and Covid-19 Recovery, The Executive Office, Northern Ireland

Dr Maurice J Perks [RSK0016](#)
- ★ Charlotte Pickles, Director, Reform

Professor Nick Pidgeon [RSK0074](#)
- ★ Leigh Pomlett, President, Logistics UK

David Powell, The University of Manchester [RSK0068](#)

Professor Michael Power [RSK0038](#)

Professor Simon Pollard [RSK0017](#)
- ★ Suzanne Raine, Affiliated Lecturer, POLIS, University of Cambridge
- ★ Alistair Read, National Training Officer at Mountain Rescue England and Wales
- ★ Dr Karen Reddin, Senior Lecturer in Disaster Management, Bournemouth University
- ★ Professor Ortwin Renn, Scientific Director, Institute for Advanced Sustainability Studies

Resilience First [RSK0015](#)

The Resilience Shift [RSK0064](#)
- ★ Dr Catherine Rhodes, Senior Research Associate of the Biosecurity Research Initiative, St Catharine's College, Cambridge

- * Professor Stephen Richardson, Emeritus Professor of
Chemical Engineering, Imperial College
- * The Lord Ricketts GCMG GCVO, former National
Security Adviser
- * Shirley Rogers, Director Organisational Readiness,
Scottish Government
- * Professor Brooke Rogers OBE, Professor of
Behavioural Science and Security, Department of War
Studies, King's College London
- Dr Jonathan Rougier [RSK0004](#)
- Royal Society [RSK0094](#)
- The Royal Society of Edinburgh [RSK0095](#)
- Mr Tom Russell [RSK0052](#)
- Sandwell MBC Budget and Corporate Scrutiny
Management Board [RSK0071](#)
- * Dr Marc Schelhase, Lecturer, Defence Studies
Department, King's College London at the Joint
Services Command and Staff College, UK Defence
Academy
- * Cathryn Scott, Director, Enforcement and Emerging
Issues, Ofgem
- * John Scott, Head of Sustainability Risk, Zurich
Insurance Group
- ** Professor Duncan Shaw, Professor of Operational
Research and Critical Systems, University of
Manchester [RSK0068](#)
- Dr Tristram Riley Smith [RSK0032](#)
- Space Environment Impacts Expert Group (SEIEG) [RSK0056](#)
- Professor Sir Stephen Sparks FRS [RSK0019](#)
- ** Professor Sir David Spiegelhalter, Winton Professor
of the Public Understanding of Risk, Statistical
Laboratory, University of Cambridge [RSK0057](#)
- SRSRM Ltd [RSK0054](#)
- Peter Taylor, Staffordshire Civil Contingencies Unit [RSK0030](#)
- * Major General Charles Stickland, Assistant Chief of
the Defence Staff (Operations and Commitments),
Ministry of Defence
- * Dr Tim Stone, Chairman, Nuclear Industry
Association
- ** Chief Constable Rachel Swann, Chief Constable,
Derbyshire Constabulary, and Chair, Derbyshire Local
Resilience Forum [RSK0087](#)
- * Adrian Tchaikovsky, Author

	Dr Scott Thacker	<u>RSK0052</u>
	Thames Valley Local Resilience Forum (TVLRF)	<u>RSK0082</u>
★	Alex Thomas, Programme Director, Institute for Government	
	Anthony Thompson	<u>RSK0076</u>
		<u>RSK0084</u>
★	John Thornhill, Innovation Editor, Financial Times	
★	Chris Train OBE, Former CEO, Cadent	
	David B Treadwell	<u>RSK0010</u>
	Dr Emma Tristram	<u>RSK0003</u>
	Trustworthy Digital Infrastructure for Identity Systems programme (The Alan Turing Institute)	<u>RSK0058</u>
	Lindsey Anderson Tusk	<u>RSK0008</u>
	Tyne and Wear Fire and Rescue Service	<u>RSK0031</u>
★	Dr Fiona Twycross, Deputy Mayor for Fire and Resilience and Chair, London Resilience Forum	
	UK Computing Research Committee, UKCRC	<u>RSK0013</u>
	UK Energy Research Centre	<u>RSK0081</u>
★	Sir Patrick Vallance, Government Chief Scientific Adviser	
	Professor Emeritus Clive Walker	<u>RSK0098</u>
★	Professor Sir Mark Walport, Former Government Chief Scientific Adviser	
★	Warning Centre, University College London	
	Warwick Manufacturing Group (WMG), University of Warwick	<u>RSK0059</u>
★	Professor Tim Watson, Director of the Cyber Security Centre, Warwick Manufacturing Group, University of Warwick	
★	Professor Charlotte Watts, Chief Scientific Adviser, Foreign, Commonwealth and Development Office	
★	Harold van Waveren, Chair, National Crisis Team for Flood Risk, Rijkswaterstaat	
	Simon Webster	<u>RSK0014</u>
	Will Webster, Energy Policy Manager, Oil and Gas UK	
	The Scottish Wildfire Forum (SWF)	<u>RSK0039</u>
	James Willison	<u>RSK0051</u>
	Wiltshire and Swindon Local Resilience Forum	<u>RSK0091</u>

John White

RSK0023

- ★ Catherine Wright, Interim Executive Director of Flood and Coastal Risk Management, Environment Agency
- ★ Paul Wyatt, Director of National Security, Ministry of Defence

APPENDIX 3: CALL FOR EVIDENCE

Call for evidence

The House of Lords Select Committee on Risk Assessment and Risk Planning was appointed on 15 October 2020 to: “consider risk assessment and risk planning in the context of disruptive national hazards”. It has to report by the end of November 2021.

A central question for this Committee is how to ensure that the UK is as resilient to extreme risks and emergencies as possible. In this paper, ‘hazard’ refers to a civil emergency without malicious intent, and ‘threat’ refers to those that arise from malicious intent. ‘Risk’ is used to describe the probability and consequence of classes of hazard or threat classes.

Questions

1. What are the most significant extreme risks that the UK faces? Are these kinds of risks discrete, linked or systemic? What do you understand the term ‘extreme risk’ to mean?
2. Are there types of risks to which the UK is particularly vulnerable or for which it is poorly prepared? What are the reasons for this?
3. How could the Government’s approach to risk assessment be strengthened to ensure that it is rigorous, wide-ranging and consistent? Your answer could refer to any aspect of the risk assessment process including, for example, its governance, the evidence base, or the degree to which it is open to scrutiny and the input of experts.
4. Given the range of possible national risks, and the need to achieve a balance between efficiency and resilience, what level of assurance should the Government be seeking on the UK’s resilience to hazards? What would effective national risk management achieve, and how could its success be measured?⁵³⁶
5. How can the Government ensure that it identifies and considers as wide a range of risks as possible? What risks does the inclusion criteria for the National Security Risk Assessment exclude and what effect does this have on long-term resilience?
6. How effectively do current ways of characterising risks (for example, the use of a five-point scoring system of a ‘reasonable worst case scenario’) support evidence-based policy decisions? What other information would be useful?
7. How effectively do Departments mitigate risks? Does the Risk Assessment process and the Civil Contingencies Secretariat adequately support Government departments to address risks within their remits? Is further oversight or accountability required, and if so, what form should that take?
8. How well are national contingency plans communicated to and understood by those at a local level, including emergency responders? What could be changed to increase the capability of local responders to effectively plan for and respond to emergencies?

⁵³⁶ “Risk management”, while more usually a financial term, is used here to express the identification, forecasting, and evaluation of risks together with the identification of procedures to avoid or minimise impacts.

9. What is the role of the individual in relation to national crises? Are there potential benefits in increasing public involvement and transparency in emergency planning? What limitations are there to this? What lessons have been learnt or should have been learnt about the approach taken to risk assessment and risk planning in this country from the COVID-19 pandemic?
10. What challenges are there in developing resilience capability? Your answer could refer to critical infrastructure, but also to systems and networks beyond those elements. What is the role of exercising to test risk preparedness, and are these methods utilised effectively in risk assessment and risk planning in this country?
11. What can be learnt from local or corporate risk management processes, or those of other countries? Are there any specific examples of practices, processes or considerations which could improve the UK's national risk resilience? How could businesses and civil society more effectively support national resilience preparation?
12. What individual or economic behaviours would strengthen national resilience against hazards, and what mechanisms are open to the Government or society to incentivise these behaviours? How should we prioritise any changes required in approach, process or policy needed to improve risk mitigation and strengthen the UK's resilience to extreme risks and emergencies?

APPENDIX 4: SUMMARY OF RESERVED AND DEVOLVED RESPONSIBILITIES

Table 1: Summary of reserved and devolved responsibilities relevant to risk and resilience

Policy area	Reserved power	Devolved power		
		Scotland	Wales	Northern Ireland
International Relations and Defence	Yes			
National Security	Yes			
Nationality and Immigration	Yes			
Nuclear Energy	Yes			
Media and Telecoms	Yes			
Health and Social Care	No	Yes	Yes	Yes
Housing, Communities and Local Government	No	Yes	Yes	Yes
Business	No	Yes	Yes	Yes
Justice and Policing	Partial	Yes	No	Yes
Energy	Partial	No	No	Yes

Source: Joint Committee on the National Security Strategy, *The UK's national security machinery* (First report, Session 2021–22, HC 231, HL Paper 68)

APPENDIX 5: ACRONYMS AND ABBREVIATIONS

BEIS	Department for Business, Energy and Industrial Strategy
CCC	Climate Change Committee
CCS	Civil Contingencies Secretariat
CMEs	coronal mass ejections
CNI	Critical national infrastructure
COBR	Cabinet Office Briefing Room
COMAH	Control of Major Hazard
FCO	Foreign and Commonwealth Office
GCSA	Government Chief Scientific Adviser
IPCC	Intergovernmental Panel on Climate Change
IR	Integrated Review of Security, Defence, Development and Foreign Policy
LGD	Lead Government Department
LRFs	Local Resilience Forums
MACA	Military Aid to the Civil Authorities
MERS-CoV	Middle East respiratory syndrome
NRR	National Risk Register
NSRA	National Security Risk Assessment
RWCS	Reasonable Worst-Case Scenario
SAGE	The Scientific Advisory Group for Emergencies
THW	Technisches Hilfswerk
UKHSA	UK Health Security Agency
UKRF	UK Resilience Forum
UKRN	UK Regulators Network
UNDRR	United Nations Office for Disaster Risk Reduction
VAAC	London Volcanic Ash Advisory Centre
VCSEP	Voluntary and Community Sector Emergencies Partnership
VEI	Volcanic Explosivity Index
WHO	World Health Organisation