

Royal Society – Written evidence (RSK0094)

Key points

- The UK should ensure that the scientific assumptions behind the national risk register are exposed and sufficiently tested by diverse experts, in order that levels of confidence and uncertainty behind the assumptions is clear, so that risk reduction, resilience and response planning are based on a sound rationale.
- Investing in resilience runs counter to day-to-day pressing investment demands, financial efficiency incentives, and short-term political cycles. The UK could consider mechanisms to run resilience planning and resources separately from day-to-day Government prioritisation.
- Increasing resilience is not just about ensuring that the UK is prepared to respond to obvious acute short-term risks, but also addressing the causes of future risks, and dealing with chronic slow-burn risks (such as risks from climate change and biodiversity losses)
- While the UK has a National Risk Register, many of the risks that the UK faces are shaped by global, not national trends. Pandemics, climate change and biodiversity loss do not respect borders. Therefore steps to increase the UK's resilience are closely linked with action to address the causes of future risks, which must be global.
- The COVID-19 pandemic has highlighted the value of establishing improved 'standing' mechanisms by which Government can, in the future, rapidly access the best scientific experts who are working at the coal face of any national crisis and are well-placed to provide invaluable scientific advice.
- The UK government should invest now to establish sophisticated mechanisms for accessing a broad range of external evidence and expertise from the UK and international science community in emergencies. This requires building better data systems to enable rapid and timely access to and analysis of data for policymakers in a way that is ethical, secure and privacy preserving.
- Public confidence in the government's approach to risks and the evidence that underpins this is crucial to successful resilience. Giving everyone the tools to critically engage with science and 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.

Introduction

1. The Royal Society is the national academy of science for the UK. Its Fellows include many of the world's most distinguished scientists internationally working across a broad range of disciplines in academia,

industry, charities and the public sector. The Society draws on the expertise of the Fellowship to provide independent and authoritative advice to UK, European and international decision makers.

2. This submission highlights a number of issues for UK resilience that have been brought into focus by the current COVID-19 pandemic. However, the Society and its Fellowship would be very happy to support the Committee going forward where our expertise is relevant to any specific lines of inquiry.

The UK should ensure that the scientific assumptions behind the national risk register are exposed and sufficiently tested by diverse experts, in order that levels of confidence and uncertainty behind the assumptions is clear, so that risk reduction, resilience and response planning are based on a sound rationale.

Investing in resilience runs counter to day-to-day pressing investment demands, financial efficiency incentives, and short-term political cycles. The UK could consider mechanisms to run resilience planning and resources separately from day-to-day Government prioritisation.

3. A viral pandemic was the top risk on the UK's risk register and thus entirely predictable. Yet preparation for the COVID-19 pandemic was inadequate, and the response to it from both governments and the science community not as expeditious as it might have been. It would be useful to improve stress testing by diverse experts of the scientific assumptions underpinning the risk register, clearly indicating levels of confidence and uncertainty (for example, that a pandemic 'flu' would not transmit asymptotically). Building in resilience not just to obvious acute risks such as the inevitable future pandemics, but also to wholly predictable chronic crises (such as climate change and catastrophic biodiversity loss) is necessary for stable growth and long-term prosperity.
4. The UK is not alone in this. The 'Second report on progress from the Independent Panel for Pandemic Preparedness and Response for the World Health Organisation Executive Board', published in January 2021, claims that the global pandemic alert system is 'not fit for purpose'.
5. To successfully build in resilience to future pandemics and other wholly predictable crises, it is important to develop a system that anticipates and counters human reasons for lack of resilience such as political short-termism, optimism bias and the perceived financial inefficiency of preparations for possible future risks, such as stockpiles. Such resilience planning may not be compatible with financial efficiency incentives and the pressing priorities of normal day-to-day business. The UK could consider how to run risk and resilience planning separately (for example, resilience in the financial system is no longer left to banks, stress tests and capital ratios are an external requirement mandated by independent central banks).

6. A long-term, evidence-informed approach is particularly important to enable the UK to prepare for the impacts and address the causes of the slow-motion, cognitively-challenging crises of climate change and biodiversity loss, which will span many governments.
7. Risk management should not be seen as a separate activity from normal strategy and business planning processes. Government from time to time places increased emphasis on one or other of its capabilities in risk, strategy, and horizon scanning. It could usefully examine future capabilities here through the lens of an integrated set of needs.

Increasing resilience is not just about ensuring that the UK is prepared to respond to short-term risks, but also addressing the causes of future risks.

8. Many of the greatest risks that the UK faces in the short-term – such as increased extreme weather events – are closely linked to long-term trends that present global challenges, such as climate change and catastrophic biodiversity loss. The National Risk Register currently provides a snapshot of our latest understanding of the UK acute risk landscape, providing some context but not assessing the true impact and likelihood of these chronic long-term risks.
9. It is important that action to build resilience to risks identified in the National Risk Register considers the underlying trends and, where appropriate, is undertaken in concert with action to address the long-term trends that cause these risks.

While the UK has a National Risk Register, many of the risks that the UK faces are shaped by global, not national trends. Pandemics, climate change and biodiversity loss do not respect borders. Therefore steps to increase the UK's resilience are closely linked with action to address the causes of future risks, which must be global.

10. Global trends that underpin prominent risks on the UK's National Risk Register include climate change and catastrophic biodiversity loss. The Register itself recognises that "the issue of climate change is by no means limited to the UK... A global problem will require a global solution."¹
11. Science plays a crucial role in understanding and responding to risks, and its success in doing so rests on global collaboration. For example, much of the response to the COVID-19 pandemic has been rooted in science – including the rapid sharing of the viral genome sequence, rapid test development, rapid identification of risk factors, extraordinary efforts to develop treatments and vaccinations. This is the result of investment in research over many decades and the commitment of an army of scientists

¹ HM Government (2020) *National Risk Register*
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 22 January 2021]

collaborating openly and widely across the globe.

12. The same is true for long-term crises such as climate change and biodiversity loss. A “national” response to such risks cannot provide for genuine mitigation. In this context, support for international scientific collaboration is essential as it can provide the breadth of evidence required on which to base policy decisions. In the context of hosting the G7 and COP26 in 2021, the UK has the opportunity to take on a leadership role in this respect, supporting a common understanding of long-term risk and collaborative responses.
13. Official Development Assistance plays a valuable role in amplifying the global response to long-term trends by supporting research and innovation investment that increases research capacity and creates relationships with future scientific leaders around the world who can advocate for evidence-informed action to address global challenges.

The COVID-19 pandemic has highlighted the value of establishing improved ‘standing’ mechanisms by which Government can, in the future, rapidly access the best scientific experts who are working at the coal face of any national crisis and are well-placed to provide invaluable scientific advice.

14. The scale and nature of the COVID-19 pandemic is unprecedented, and initially overwhelmed the Government’s abilities to access and deploy the UK’s operational science capabilities at sufficient scale and speed. For example, the UK government’s Scientific Advisory Group for Emergencies (SAGE) is designed to provide scientific and technical advice to support government decision makers during emergencies - its focus is on providing timely and coordinated scientific advice to decision makers to support UK cross-government decisions. As such, it is not necessarily ideal for responding to a long-term problem – as the coronavirus emergency has now become. For this, standing groups with a specific mix of expertise chosen in light of the nature of the ongoing problem may be more appropriate.
15. It will be important to establish mechanisms now by which Government can access rapidly the best scientific advice from the wider research community when future crises occur. The National Academies are well placed to help in his endeavour as they contain many of the experts needed and have a network into others.
16. The COVID-19 pandemic has also highlighted an issue that has significantly hindered flexibility and agility to respond to a developing crisis and should be addressed for future. Neither the public nor the private sector has strong organisational competence in well governed access to data and its exploitation. There have been significant limitations in data systems that have hampered the UK’s response. **The government should invest now to establish sophisticated mechanisms for accessing a broad range of external evidence and expertise from the UK and international science community in**

emergencies. This requires building better data systems to enable rapid and timely access to and analysis of data for policymakers in a way that is ethical, secure and privacy preserving.

17. The UK is well-placed to do so as it has extraordinary data science capability and there have been large-scale and rapid interventions to build data systems to respond to COVID-19. There is a moment now to build on that rapid digital transformation to build resilience to future crises, through concerted multi-sectoral action in order to establish:
 - a. Systematic data collection – building on the current initiatives to gather comprehensive surveillance data across the whole population
 - b. Quality and timely data – there is a need for up-to-date and accurate data to understand where interventions are needed and whether and where they are working
 - c. Connected data – data which is linked across the various parts of the health system and beyond
 - d. Data access – enabling swifter and easier access to data by researchers helping to respond to the pandemic
 - e. Data governance – ensuring that robust governance arrangements, such as data sharing agreements, are established in advance so that agreements to access and use data can be made rapidly, safely and ethically

18. In addition to these data systems, responses to emergencies can be informed by the data collected as a by-product of daily activities. This data is not originally collected with a particular research or policy question in mind but are created through the normal course of events in our digital lives, and our interactions with digital systems and services. To be useful it needs to be anonymized, aggregated and statistically calibrated to provide meaningful metrics for robust decision making while managing concerns about individual privacy or business value. This process requires particular technical and domain expertise that is often found in *academia*, but it must be conducted in partnership with the *industries*, and *public sector organisations*, that collect or generate the data and *government* authorities that take action based on those insights. Such collaborations require governance mechanisms that can respond rapidly to emerging areas of need, a common language between partners about how data is used and how it is being protected, and careful stewardship to ensure appropriate balancing of data subjects' rights and the benefit of using this data.

19. In the case of the COVID-19 pandemic, where successful multiparty data sharing collaborations between academia, the private sector and government have been established at pace, they have often relied on relationships that existed before the pandemic, which could be rapidly adapted to pandemic needs. In the long-term, new initiatives are needed to cultivate such partnerships, so that data sharing efforts can be repurposed at times of crisis, in ways that encourage public dialogue about data use. Such 'pathfinder' projects can help to create the systems and agreements to use data at pace in an emergency. ⁱ

Public confidence in the government’s approach to risks and the evidence that underpins this is crucial to successful resilience. Giving everyone the tools to critically engage with science and 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.

20. There are a number of steps that should be taken to ensure this:

- **Develop simulations and data visualisations that boost accessibility and understanding of complex data:** Decisions are made based on complex data and analyses. Robust simulation and powerful visualisation has the potential to enhance the understanding of these and improve the ability of policymakers and the public to meaningfully scrutinise decisions.
- **Recognise uncertainty:** Experts should engage publicly, taking time to explain the evidence and the limitations of this. When they are ‘pitted against’ other experts over emerging areas of knowledge, they should take responsibility for explaining why debate continues and highlight unknowns that prevent a conclusion that one view is right and one is wrong.
- **Engage with the public honestly, openly and transparently:**
 - Publication of the UK’s National Risk Register is valuable.
 - Experts should continue to work with organisations like the Science Media Centre (SMC) that can ensure that expert voices are available to the media to explain concepts and outline the evidence, being clear about its limitations.
 - The government should continue to invest in skilled people and organisations that support meaningful public engagement with the challenging and sensitive questions that are raised by the progress and application of science and use this to inform policymaking.
- **Longer term, the government should review the education system to ensure that it provides everyone with the tools to critically engage with science, empowering them to make informed choices about scientific and technological development and equipping them to work in an advanced knowledge economy.** The government should establish a royal commission to set out a vision for a secondary education system that will nurture future generations of innovative thinkers and resilient citizens.

ⁱ *Data Readiness: Lessons from an Emergency (rs-delve.github.io)*

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