RESPONSE TO HOUSE OF LORDS RISK ASSESSMENT AND RISK PLANNING COMMITTEE INQUIRY

1 The Royal Society of Edinburgh (RSE), Scotland's National Academy, welcomes the establishment of the House of Lords Risk Assessment and Risk Planning Committee. The Committee's inquiry on Risk Assessment and Risk Planning provides a timely opportunity to learn lessons from the Covid-19 pandemic with a view to strengthening the UK's preparedness for future shocks and disruptions. The response to the pandemic demonstrates the importance of taking steps to build up the UK's national resilience.

2 The RSE has established its Post-Covid-19 Futures Commission to support Scotland's recovery from the pandemic by stimulating discussion and activity aimed at building a fairer and more resilient society by addressing both immediate challenges and longer-term policy and practice questions.

3 Our Commission is based around four thematic workstreams, including one focussed on *Building National Resilience*.[1] Our Building National Resilience working group is:

- considering what a resilient nation looks like and the features that underpin resilience;
- identifying the key future threats and challenges facing Scotland;
- exploring how resilience can be built up and developed.

4 This response has been prepared by the RSE's Building National Resilience working group and represents the group's evolving thinking on resilience, the attributes of resilience, and on the priorities for supporting resilience. We are engaging widely to inform our work as it is important to hear a breadth of perspectives on what resilience means to different individuals and organisations. We would be pleased to discuss our work programme with the Committee and to explore the potential for joint activity in areas of shared interest. In the meantime, our working group is pleased to have the opportunity to offer the following comments in response to the Committee's call for evidence.

5 We recognise that through the inquiry the Committee is seeking to generate a fuller understanding of the most significant risks that the UK faces. We would be pleased to discuss the findings from our engagement and consultation with the Committee following the conclusion of this activity.

What is Resilience?

6 Resilience is defined as a capacity to sustain functionality while an external stress is being applied. A resilient entity is one that can adapt rapidly as well as learn from the experience of being stressed. At national scales the assumption is that resilience exists within a very wide range of functions from individual well-being to national systems, from databases to extended supply chains, and arguably is built from the bottom-up by having resilient people who have the capacity to cope with adversity and find solutions to problems. Making national resilience "systemic" means that all entities, large, small, individual or institutional, need the properties of resilience.

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1 The four thematic workstreams are: Data, Evidence and Science; Inclusive Public Service; Public Debate and Participation; and Building National Resilience. More information is available at: https://www.rsecovidcommission.org.uk/

Covid-19 and Resilience

7   The global Covid-19 pandemic has highlighted low levels of resilience in nations across the world. The Covid-19 pandemic was a predictable event, even if the timing and exact nature of the event could not be foreseen. The UK's National Risk Register (NRR) indicates that there is a high probability of an influenza pandemic occurring. While the World Health Organisation (WHO) had identified novel coronaviruses as a threat, it is notable that the NRR did not explicitly identify the potential threat of coronaviruses. This points to the UK being better prepared for influenza, but not for a novel coronavirus. As a result, it seems likely that in the early stages of the pandemic, the modelling and preparedness were based on a legacy of influenza experience. This raises issues about the UK's approach to risk assessment and preparedness. The RSE has recommended that the NRR should categorise more specifically emerging infectious diseases.[2]

Need for overarching focus on resilience

8   There is a concern that future risk planning will focus on planning for a response to the last crisis i.e. Covid-19 pandemic, rather than for future events that may be wholly different. Pandemics are just one of many high impact low likelihood risks which any nation is faced with managing. In this response we have therefore sought to highlight what we believe to be the key components of resilience and how resilience can be enhanced.

Systemic approach to resilience

9   Many entities, like nations, can be viewed as nested sets of networked individuals, organisations and institutions each of which has a relationship with other components. These relationships can take many forms including physical, financial, or social. These individual physical components and their interactions add up to make a *system* and this is composed of sub-systems of interacting components, like the food system where foods are moved between different actors or nodes along a supply chain to the consumer. There are many other sub-systems of national systems, like transport systems or the financial system and each system intersects with other systems. This means that what happens within one sub-system of a nation can affect what happens within other sub-systems. This interconnectedness means that resilience can only be achieved when it is managed across all critical sub-systems as a whole.

Resilience and System Efficiency

10   No system is completely immune to shocks or stress. It is impossible to predict and mitigate all causes of potential failure, but it is important for decision-makers to consciously decide on the desirable level of resilience. The right levels of resilience will vary among different systems and between different system components.

11   There is likely to be a strong trade-off between *system efficiency* and resilience. Efficiency can be defined in many different ways but for the purpose of this response it would cover the rate of flow of goods (e.g. money, food, energy, social agency) through the system relative to the total of those goods stored as capital reserves within the system. Low efficiency systems have low rates of flow relative to the stored capital within the system. "Just-in-time" supply chains are high efficiency systems because they imise flows over capital reserves. Some complex systems create diverse routes of delivery, but they also have innate capacity to store resources.

12   One feature of very efficient systems is that they are sophisticated in their ability to predict demand and use that to drive sources and levels and timing of supplies. They are often highly adaptive and driven by real-time and historic data inputs. This capacity to be adaptive could aid resilience. In many human social systems, the market is designed specifically to drive up efficiency through competition and this is apparent within many critical markets, such as energy. These kinds of markets are driven to minimise the price paid by consumers, but they have not necessarily been designed with a policy of resilience in mind. If we want resilient systems, we will need to start to measure and trade-off between these different drivers.

2   RSE response to the House of Commons Science and Technology Committee inquiry into the UK response to Covid-19: Use of scientific advice (August 2020) https://www.rse.org.uk/wp-content/uploads/2020/09/AP20-12.pdf

13 A key question which needs to be addressed is whether there is an unavoidable trade-off between economic efficiency and resilience. If this is true, which seems likely in many sectors of the economy, then building a resilient nation will need different economic objectives from those currently being pursued across the developed world.

14 Many of these factors are well illustrated by natural systems, including examples of ecosystem collapse. While many and varied, the general pattern associated with ecosystem collapse is one of simplification of ecosystems to maximise production of a specific benefit e.g. food or timber. The removal of 'redundant' features leaves ecosystems vulnerable to natural shocks, such as floods or drought. Conversely, more resilient natural systems are ones that are characterised by far greater diversity and interconnectedness at a range of scales. In this context, the loss of biodiversity through human activity has been identified as a key driver of emerging infectious diseases and pandemic risk. Urgent action is therefore needed to improve levels of biodiversity and ecosystem health to minimise the risk of future pandemics and the associated long-term societal and economic impacts.[3, 4]

Perceptions of, and attitudes to, resilience

15 Resilience is often seen as "nice-to-have" but is usually of insufficiently high priority to attract investment of time, effort, or money. The cost of non-resilience and its impact – whether to a business, government or society – is rarely understood, calculated, or considered as a "do nothing" option in business cases. We tend towards "optimism bias" and events which are far off in the future, which is often the case for low-frequency events even if they are likely to have high impact, are discounted both socially and financially, meaning they attract little investment resulting in low resilience. In addition, as technology moves forward there is even less incentive to invest in resilience because there is always a hope the new technology will make it easier and cheaper to respond if a specific high impact risk should manifest. There are, therefore, many incentives working to discourage investment in resilience, whether at the personal, institutional or national level. These points are significant as they mean that people and society more generally are likely to be misjudging risk which becomes systemised in the interests of maximising efficiency. Changing the perceptions of resilience is therefore crucially important and this requires long-term investment in leadership and communication.

Where does responsibility lie?

16 The moral hazard with the theme of resilience is that it is always somebody else's problem. In this situation, resilience is very unlikely to gain attention. A significant step forward is needed to help all sectors of society to understand risks and to build resilience. Markets can be an important mechanism to deliver resilience but actors within those markets need to be operating with a clear set of guidelines or regulations. In the UK, government has failed to construct a system of governance, guidance and regulation which effectively shares risk across broad sections of society. There are some who argue that resilience starts with the individual and that this aggregates to households, businesses, local government, corporate structures, institutions, government agencies and national government itself. All these entities need to know and understand their responsibilities and it is the job of government to ensure all these components play their part and to hold them to account. This contrasts with the current situation where many entities at all these scales do not realise or accept there are risks, or turn to others, including government, to manage risks and deliver resilience.

3 OECD. Biodiversity and the economic response to COVID-19: Ensuring a green and resilient recovery. http://www.oecd.org/coronavirus/policy-responses/biodiversity-and-the-economic-response-to-covid-19-ensuring-a-green-and-resilient-recovery-d98b5a09/. (September 2020)

4 IPBES. Pandemics. https://www.ipbes.net/pandemics. (July 2020)

Attributes of Resilience

17 From our work to-date, we have identified the following six attributes of resilience. Embedded resilience in nations calls for a pivotal role for government to deliver the right mix of these attributes using both market and regulatory mechanisms.

I.   **Diversity** – Systems which deliver the same outcome via many different routes are much less likely to succumb to failure if one or more of its key components is compromised when the system is stressed. Diversity refers to everything from institutional structures and businesses to supply chains, land use options and people.

II. **Redundancy** – This means designing systems in ways which mean they can flex in response to stress. This includes creating strategic reserves and sufficient stocks to buffer against supply shortages and investing in infrastructure with greater safety tolerance. Loss of redundancy is typified by just-in-time methods.

III. **Connectivity** – Well-designed and securely implemented connectivity which enhances redundancy and diversity within and between systems creates buffering against localised stresses. This is illustrated in energy supply grids which have trans-national interconnectors that can allow power to flow between different national grids thus allowing them greater localised resilience to cope with short-term power shortages.

IV. **Inclusiveness, equity, and fairness** – The impacts of Covid-19 have been felt disproportionately by certain parts of society, including among different ethnic minority groups and by women, and the pandemic has highlighted differences in resilience across individuals, communities, sectors and business models. Social policies which sustain but also value those in the most vulnerable communities need to focus on the power, agency and justice of those who are most disadvantaged, thereby supporting people to create their own resilient solutions.

V.   **Adaptive Learning** – Resilience requires the flexing of the systems which sustain the structure and function of society in the presence of stress. The rapid adoption of new technologies and especially digital resources has been one of the successes of the Covid-19 pandemic and is likely to feature strongly in future. In adopting these positive solutions, we cannot however lose sight of the digitally vulnerable – those who run the risk of exclusion or exploitation due to society's increasing dependence on technology. Only if we absorb the lessons from these experiences will society evolve to become more resilient.

VI. **Culture of Preparedness** – This relies on proactive management of resilience in the face of known and unknown risks involving the allocation of responsibilities between national governments, markets, businesses, institutions, and individuals. This includes having the capacity to monitor system states and assessing the likelihood of future failure so that adaptation can be introduced to head off system failure. It requires risk awareness, "what if" thinking, and practising what it takes to respond and recover effectively. This practice can be simulated (e.g. in emergency exercises) or learned. Cultural differences therefore exist in resilience among nations and communities, often modulated by recent experiences. For example, places where there are frequent periods of extreme weather are likely to have different levels of resilience to other types of stresses from regions where stress is rare.

Priority Actions to Support Governance of National Resilience

18 Through our discussions and work to date, we have identified the following five priority actions which we believe are required to support improved governance of national resilience.

I. *Build a national risk register and a national risk assessment.* These should be under continuous review, but they should also form a view of the *aggregate* and *interdependent* risk to a nation. It is not enough to consider only risks individually. Only by understanding the totality of the collective risk can we gauge the national risk. When a portfolio of low frequency, potentially interdependent, high impact risks is brought together at a national scale the aggregate of these, i.e. the overall national risk, is usually quite high.

II. *Communicate national risks openly and honestly.* Too often, national risk registers and assessments are the preserve of specialists and are not the subject of national debate. However, it is crucially important that there is widespread national public debate about risk and risk management so that the public can both play its part in supporting resilience and to holding decision makers to account. Public input and buy-in are also needed in determining desired levels of resilience and in balancing potential trade-offs between different elements.

III. *Ensure that people, including everybody from households to institutions, are aware of, and can prepare for, national emergencies, including being supported to do so.* This is about risk-sharing and ensuring equity in resilience decision-making. It also emphasises inclusivity, ensuring that diverse views on resilience are sought.

IV. *Create a set of key performance measures for resilience.* Although measuring resilience is difficult, some specific measures, such as bank reserve capital, the status of strategic reserves of critical response equipment or supplies, the awareness of people of the need to plan for resilience as well as associated resources, are the kind of examples which could be used. Efforts need to be made to ensure these Key Performance Indicators (KPIs) are paid more than lip service in policy, procurement, corporate governance, and regulation and are transparently traded against other in-tension KPIs, such as short-term profit. Moreover, it is important to measure, monitor and respond to "near-misses" because these inform about where systems might be vulnerable.

V. *Mainstream resilience testing in policy and decision-making.* Only by stress-testing what government does, from local planning decisions to national fiscal policy, against resilience will there be sufficient adaptation at a systemic level to create resilience. Government also has a key role in creating the conditions in which resilience thinking is mainstreamed and supported across all parts of society.

Additional Information

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Responses are published on the RSE website (https://www.rse.org.uk/)

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