European Commission

Science for Environment Policy

‘Emerging risks’ identified as first of four key stages in a risk cycle

The phrase ‘emerging risk’ has been widely used in scientific and business communities, but without consensus on how to define and govern such a risk. A new study proposes that risk emergence goes through four states, from ‘unknown unknowns’ to risks that are fully in the public domain. Understanding emergence as a process can help decision makers detect and manage risks on the basis of scientific evidence.

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Emerging risks, Risk assessment

Risk governance tends to be adapted to routine risks, rather than emerging risks, which can evolve rapidly, affecting multiple stakeholders across geo-political boundaries. For example, unforeseen events such as the 2007 financial crisis and 2011 Fukushima disaster have highlighted how the world can quickly change without warning, with no set procedures in place for managing the effects.

Despite this awareness, the literature review found no unified, usable definition of emerging risks that could help policymakers with a framework for managing them. For example, in some definitions, an emergent risk is simply one that a stakeholder has failed to recognise so far, therefore preventing the calculation of probabilities and expected loss. Others emphasise that the risk will have an impact in the next one to five years, making them a priority for action over longer-term risks.

Some organisations highlight the dynamic nature of a risk portfolio, due to new technology, processes, discoveries or behaviours. For example, the European Food and Safety Agency (EFSA) connects emerging risks to newly identified hazards or increased exposure to known hazards. Uncertainty and magnitude of consequences also feature in definitions, yet these can also be associated with risks that are not emerging — thus they are not unique characteristics.

Instead of a type of risk, the study proposes that emerging risks in fact describe a stage in the risk cycle prior to full recognition at the scientific or societal level; at some point, every risk has been ‘emerging’. To deal with the real and socially constructed challenges posed by emerging risks — to mitigate or prevent their consequences — policymakers need to develop capabilities in signal detection and foresight.

The path of risk emergence can go through one or all of three states before reaching full emergence:

Ontological: when combinations of activities and stakes (societal values) with potentially negative outcomes are modified, or when new combinations occur. These risks can be totally hidden from human perception (‘unknown unknowns’) until a change occurs. For example, asbestos has been used for at least 2 000 years, but the first death related to it was only officially recorded in 1906.

Epistemological: when science highlights that an activity poses a threat, although the risk is uncertain and long-term studies are needed to gather evidence of the risk. For example, scientific literature recognises the risk of cancer from exposure to electromagnetic fields, but the extent of this risk is subject to conflicting evidence and only acknowledged by the World Health Organization as a possible carcinogen.

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Societal: where a risk is officially recognised, as well as the necessity for dedicated policies, responsibilities and acceptability levels. This stage does not necessarily follow ontological or epistemological emergence, but can be the result of social pressure or the application of the precautionary principle. For example, following the latter, France banned the endocrine disruptor Bisphenol A in 2012, although the EFSA states that exposure levels do not present a health risk.

Fully emerged: where both scientific communities and policymakers agree there is a need to deploy appropriate risk policies, and scientific evidence continues to confirm the need to take action. The researcher argues that public debate on risks in the societal state are not necessarily influenced by scientific knowledge, but 'fully emerged risks', e.g. climate change, are confirmed by scientific evidence.

Risk ownership is highlighted at both the epistemological and societal stages. Insurance contracts and court decisions can set precedents with regards to responsibility, even where risks are scientifically controversial. For example, a French court awarded damages to a victim of electro hypersensitivity syndrome in 2015, for the first time. This sends a clear signal that there is a need for regulators and stakeholders to adopt a position on emerging risks even at the scientifically controversial stage. To base governance on scientific evidence, policymakers should make decisions on who holds responsibility for the risks related to novel activities and substances, e.g. nanoparticles, before the debate reaches the societal stage.

This approach invites policymakers to focus on risks at the ontological and epistemological stage in order to manage outcomes. Successfully detecting and interpreting early signals of change can even prevent negative effects of hidden risks. Moreover, the development of foresight capabilities can provide valuable analysis of risks and opportunities that may appear in the future. Both these techniques are fundamental for policymakers when defining the appropriate strategies for managing emerging risks.

Assigning risk ownership is not always simple, especially where the risk sits across different areas of responsibility. With such risks, when no single entity is officially in charge, the risk can be 'orphaned', resulting in no action. Governing the risks of global warming and other cross-boundary environmental issues requires going beyond national governance structures. For policymakers, this means long-term planning, co-ordination and collaboration across managerial levels.