

## 4.2 Systemic Risk

### Hotspot Description

The risk that actuaries may not allow appropriately for the increasing global interconnectedness of risk or may be inappropriately guided by groupthink.

### Current Influences

As global interconnectedness increases so systemic risk increases and past correlations between different economies and countries become uncertain guides to the future. It remains to be seen whether the impact of the COVID-19 pandemic causes a short-term retrenchment and reduction in trade interconnectedness and increased sensitivity to the vulnerability of supply chains for a period of time.

The Internet of Things also makes wider groups of people exposed to a cyber failure or attack. Groupthink remains an issue, particularly as technology changes the world so quickly. Due to the impact of the COVID-19 pandemic remote working has increased significantly and may lead to wider societal changes (e.g. movements in population densities in different parts of the country).

Climate change may lead to nature adaptations that are unpredictable and therefore make pricing of insurance products more uncertain. In the long-term the impact of climate change is the most significant systemic risk, but short-term sentiment has been strongly influenced by the COVID-19 pandemic.

The COVID-19 pandemic introduces uncertainties into the assumptions to be used for both mortality and health future experience as well as the future economic experience to be assumed in the UK once the COVID-19 pandemic has subsided. The COVID-19 pandemic has also provided a reminder to us that the modern world is intrinsically interconnected regardless of political or other man-made decisions.

### Key developments and JFAR member regulators' actions during 2020/21

The JFAR Risk Perspective 2019/20<sup>54</sup> contained a fuller consideration of the nature of systemic risk and the reader is referred there for more detail.

The last year has shown that interconnectedness is not limited by category but extends across categories. For example, the COVID-19 pandemic has been not just about health, but also about financial stability and climate change.

The COVID-19 pandemic has dominated global life since early 2020 and into 2021: this section of the JFAR Risk Perspective 2021 focuses largely on that topic.

<sup>54</sup> <https://www.frc.org.uk/getattachment/2bddf6ca-7d5d-4f79-9560-ff023142fc76/JFA-Risk-Perpective-Web-2-1.pdf>

According to the United Nations Environment Programme<sup>55</sup> COVID-19<sup>56</sup> is zoonotic<sup>57</sup> i.e. the virus is passed from animals to humans. Such infectious diseases are occurring more frequently due to a number of factors: 75% of all emerging infectious diseases<sup>58</sup> are zoonotic.

According to the World Bank<sup>59</sup> climate change can increase the risk of an epidemic like COVID-19 in a number of ways, including by causing deforestation. Deforestation is responsible for 31% of the zoonotic diseases.<sup>60</sup>

Systemic failures may be considered either to be of the domino type or the tsunami type.<sup>61</sup> The first type occurs where an event creates aligned behaviours that cause multiple failures. The second type occurs when a single overwhelming event swamps the system. For the domino type event it is the correlation between risk factors that does the damage (and the lack of appreciation of how strong these correlations are).

### The Impact of the COVID-19 Pandemic

In the Global Risk Report 2021<sup>62</sup> infectious disease was included in the top five by likelihood and was number 1 by impact. The report categorises risks into “*clear and present danger*” (horizon of 0-2 years), “*knock-on effects*” (horizon of 3-5 years), and “*existential threats*” (horizon of 5-10 years).

In the short-term category infectious diseases and livelihood crises are the top two concerns with extreme weather events coming third. In the medium-term category asset value falls and IT infrastructure failure come top and in the long-term category weapons of mass destruction and state collapse come first and second with biodiversity loss being third in the list of global concerns.

It is therefore clear that the effect of the COVID-19 pandemic has been to focus attention and concern on the risks of infectious disease and the resulting economic meltdown that can arise in the aftermath of measures designed to combat the health effects.

### The Human Cost

Aggregator websites<sup>63 64</sup> show the number of cases, recoveries, and deaths from COVID-19, updated on a daily basis. As of mid-May 2021 the cumulative number of cases worldwide is approximately 165 million and the number of deaths is around 3.4 million. In the UK the number of cases was 4.4 million and there were 127,000 deaths (a crude mortality rate of 2.9%). The crude mortality rate globally and for Europe are around 2.1% and 2.2% respectively. However, at the time of writing further strains (i.e. variants) of COVID-19 are being identified and it remains too early to know what the final statistics will show.

These numbers represent total deaths where COVID-19 is mentioned as cause. The Continuous Mortality Investigation (CMI) produces a weekly monitor showing excess deaths (compared to the expected value in the absence of the COVID-19 pandemic). To mid-May 2021<sup>65</sup> the number of UK ‘excess deaths’ is approximately 100,000.

The impact of COVID-19 on future mortality and morbidity remains uncertain. Given that deaths have numbered disproportionately among the older population it might be thought that future mortality could improve (the vulnerable having been reduced in number). However, the world has also seen the development of Long COVID. This is recognised as a condition by the National Health Service<sup>66</sup> (NHS) and they have established a Long COVID

<sup>55</sup> [https://en.wikipedia.org/wiki/United\\_Nations\\_Environment\\_Programme](https://en.wikipedia.org/wiki/United_Nations_Environment_Programme)

<sup>56</sup> <https://en.wikipedia.org/wiki/COVID-19>

<sup>57</sup> <https://en.wikipedia.org/wiki/Zoonosis>

<sup>58</sup> <https://www.unep.org/news-and-stories/statements/preventing-next-pandemic-zoonotic-diseases-and-how-break-chain>

<sup>59</sup> <https://blogs.worldbank.org/climatechange/fighting-infectious-diseases-connection-climate-change>

<sup>60</sup> <https://www.ecohealthalliance.org/2017/11/deforestation-impact-planet>

<sup>61</sup> <http://www.nematrion.com/Pages/SystemicRiskCombined.pdf>

<sup>62</sup> <https://www.weforum.org/reports/the-global-risks-report-2021>

<sup>63</sup> <https://covid19.who.int/>

<sup>64</sup> <https://www.worldometers.info/coronavirus/>

<sup>65</sup> <https://www.actuaries.org.uk/system/files/field/document/Mortality-summary-pandemic-monitor-Week-18-2021-v01%202021-05-18.pdf>

<sup>66</sup> <https://www.nhs.uk/conditions/coronavirus-covid-19/long-term-effects-of-coronavirus-long-covid/>

Taskforce.<sup>67</sup> It is estimated that approximately 300,000 people<sup>68</sup> in the UK have symptoms of Long COVID and it is as yet unknown how long the symptoms may continue or the ultimate health impact.

It is therefore clear that actuaries will need to use judgement when determining what assumptions to make about future mortality and whether to make adjustments to that indicated by past statistics. This topic is discussed more-extensively in Ageing Population and Affordability (Section 4.3, Page 20).

TPR's Annual Funding Statement<sup>69</sup> (May 2021) urges trustees of DB pension schemes to take a prudent view with respect to the future impact of COVID-19 on life expectancies when setting technical provisions, in the absence of any currently reliable evidence.

## Financial Impacts

The COVID-19 pandemic has severely depressed economic performance in the UK and globally. The Office of Budget Responsibility (OBR) has estimated<sup>70</sup> that UK GDP declined by 9.9% over 2020. UK government expenditure (and borrowing) to enable the UK to cope has run into hundreds of billions of pounds. It is widely expected (and quantified by the OBR) that the next few years will exhibit weaker financial performance than anticipated previously.

The financial impact of COVID-19 has had varying impacts on the ability of pension schemes' sponsoring employers to support their pension scheme. TPR has issued extensive guidance to pension schemes' trustees and sponsoring employers on the short-term and long-term impacts throughout 2020, and again in their most recent Annual Funding Statement (May 2021).

Business interruption costs arising from the COVID-19 pandemic have been significant and it was unclear whether insurers were obligated to meet the business interruption costs caused by lockdown closure. For small businesses this was a very significant issue and the FCA brought a test case to the courts for rulings on the interpretation of a group of insurers' policy wordings. This topic is discussed further in Geopolitical, Legislative, and Regulatory Risk (Section 4.5, Page 34), sub-section 'Business Interruption insurance' (Page 34).

On 15 January 2021 the UK Supreme Court handed down a judgment<sup>71</sup> on appeal from an earlier judgment<sup>72</sup> by the UK High Court. Following the ruling the FCA has published a Policy Checker<sup>73</sup> so that businesses can check whether their policy wording does cover business interruption caused by the COVID-19 pandemic. The FCA is publishing data<sup>74</sup> on insurers' claims received and payments made to policyholders.

## IFoA Pandemics Hub

A considerable body of helpful material has been built up and collated on the IFoA website under the heading Pandemics Hub<sup>75</sup> relating the actuarial aspects of the COVID-19 pandemic.

The Pandemics Hub includes:

- IFoA COVID-19 Action Taskforce<sup>76</sup> (ICAT) details showing workstreams grouped by practice area together with outputs to date;
- links to external resources (International Actuarial Association and various overseas actuarial profession websites together with academic, medical, and regulatory links); and
- CMI mortality monitor showing regular and frequent updates on how COVID-19 deaths are affecting mortality experience.

<sup>67</sup> <https://www.england.nhs.uk/coronavirus/post-covid-syndrome-long-covid/#long-covid-taskforce>

<sup>68</sup> <https://www.bbc.co.uk/news/uk-england-oxfordshire-55668650>

<sup>69</sup> <https://www.thepensionsregulator.gov.uk/en/document-library/statements/annual-funding-statement-2021>

<sup>70</sup> <https://obr.uk/overview-of-the-march-2021-economic-and-fiscal-outlook/>

<sup>71</sup> <https://www.bailii.org/uk/cases/UKSC/2021/1.html>

<sup>72</sup> <https://www.bailii.org/ew/cases/EWHC/Comm/2020/2448.html>

<sup>73</sup> <https://www.fca.org.uk/firms/business-interruption-insurance/policy-checker>

<sup>74</sup> <https://www.fca.org.uk/data/bi-insurance-test-case-insurer-claims-data>

<sup>75</sup> <https://www.actuaries.org.uk/news-and-insights/public-affairs-and-policy/epidemics-and-pandemics-hub>

<sup>76</sup> <https://www.actuaries.org.uk/news-and-insights/public-affairs-and-policy/pandemics-hub/covid-19-action-group>

The Pandemics Hub lists 52 ICAT sponsored workstreams showing 54 outputs (to mid-April 2021) with many other outputs pending. These outputs contain short articles, blogs, and longer articles / papers and cover such areas as:

- economic impacts;
- impacts on asset portfolio choice for life insurers and pension schemes;
- impact on general insurance (GI) and health pricing;
- impact on GI claims development;
- behavioural aspects;
- effectiveness of Enterprise Risk Management (ERM) frameworks;
- scenario modelling;
- impact of vaccination on mortality; and
- impact on social care.

It will take more time before the ultimate impact of the COVID-19 pandemic finally becomes definitive, but there is currently a great deal of material available to practitioners and the challenge to actuaries is to sift through the material and apply professional judgement to extract the information that is relevant to the circumstances that they are considering.

### Internet of Things (IoT)

The number of connected smart devices continues to increase faster than predicted. The JFAR Risk Perspective 2019/20<sup>77</sup> reported that it was estimated that there would be 26 billion such devices in 2021. The latest estimate<sup>78</sup> in November 2020 is that there will be 35 billion such devices by 2021 and 75 billion such devices by 2025.

In two respects<sup>79 80</sup> the IoT has been fuelled by the COVID-19 pandemic. First, healthcare investment in smart wearable devices is expected to 'skyrocket' and the COVID-19 pandemic has also led to a ballooning of on-line medical appointments and remote

consultations. On the one hand this may open the way for more-accurate remote diagnostics through these devices but on the other hand remote consultations may be more prone to error. It is therefore difficult to predict what impact these changes may imply for healthcare costs.

The second aspect that the COVID-19 pandemic has promoted has been working from home. This has represented an extreme acceleration of a trend that had been developing slowly. Lockdowns enforced a rapid switch to working from home for those who could do so. The experience proved the reliability of the technology and created a widespread culture of virtual networking and meeting.

An immediate implication has been the need for organisations to think more carefully about the security of their IT systems – for the first time private home computers became an integral part of the corporate business infrastructure and protocols were needed to ensure that businesses did not become vulnerable to cyber-attacks.

In the longer term the impact of the 'proof of concept' of employees working effectively and efficiently from home may lead to radical changes to the nature of work. It is easy to imagine corporates needing less central office space and having more-sophisticated IT equipment for use by employees who will live wherever they choose (and not necessarily within large conurbations or within easy commute of their offices). However, there will be knock-on impacts on the viability of sectors of the economy reliant on the footfall and business of commuting workers.

The implications of this change are likely to be profound, both at the societal level as well as at the statistical level. Actuaries will need to consider carefully how the changing movements within the country may impact (for example) postcode as a useful proxy for differential mortality or morbidity.

<sup>77</sup> <https://www.frc.org.uk/getattachment/2bddf6ca-7d5d-4f79-9560-ff023142fc76/JFA-Risk-Perspective-Web-2-1.pdf>

<sup>78</sup> <https://www.forbes.com/sites/danielnewman/2020/11/25/5-iot-trends-to-watch-in-2021/?sh=347839b6201b>

<sup>79</sup> <https://go.forrester.com/blogs/predictions-2021-technology-diversity-drives-iot-growth/>

<sup>80</sup> <https://www.bernardmarr.com/default.asp?contentID=2125>

## Summary

The last year has reminded us of the interconnectedness of much of the world that surrounds us. While the tsunami type of event is always a possibility it is likely to be difficult to protect against these, except on a global basis. Additionally, actuaries must take seriously the risk of the domino type events occurring where the correlation and connectedness between seemingly independent bodies or effects has not been recognised sufficiently.