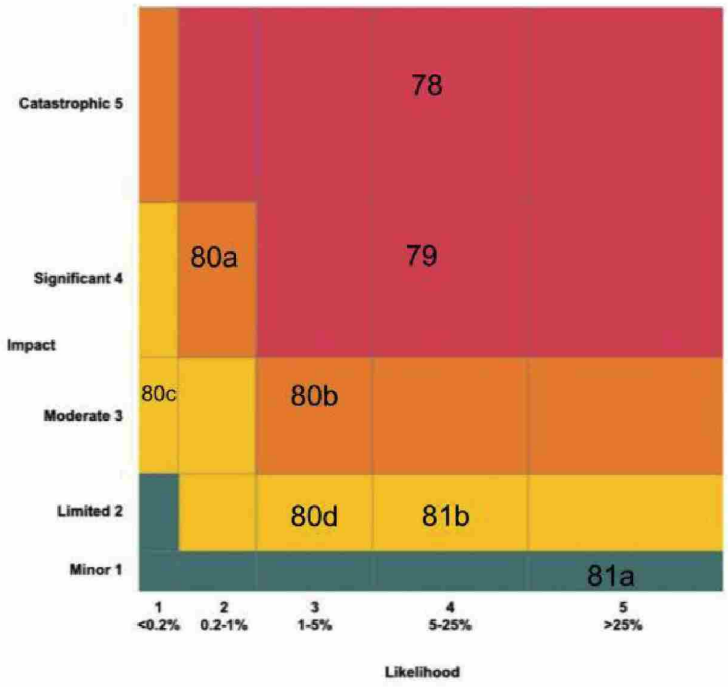
Human, Animal and Plant Disease

This chapter covers human diseases with a much broader review of the risks than before to reflect the lessons identified from the COVID-19 pandemic. These risks could have a potentially major impact causing numerous fatalities and casualties and affecting workforce availability. The chapter also includes more animal diseases and for the first time plant pest diseases to more reflect the wide range of risks posed by animals and plants and the possible impacts these could have.

Highlights:

- The Pandemic (R78) risk has been reframed to reflect a more generic scenario rather than focussing on a single disease. Both Pandemic and Emerging Infectious Disease (R79) risks have increased in likelihood with Emerging Infectious Disease also increasing in impact
- To more effectively represent the consequences and different planning requirements of different animal pathogens 4 animal disease scenarios are now provided comprising Foot and Mouth, Avian Influenza, African Swine fever and Horse sickness
- Plant pathogens are included for the first time with Xylella fastidiosa and Agrilus planipennis scenarios

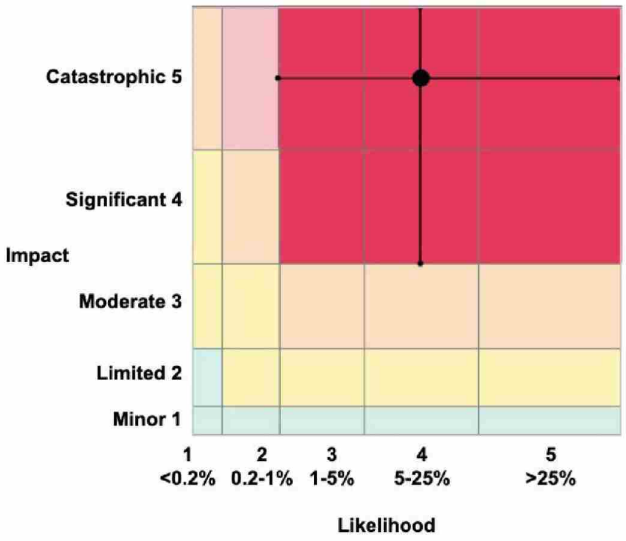


Pandemic

R78 - DHSC

Description (scenario)

Pandemics are the result of a novel pathogen (organisms, including viruses, bacteria, fungi, uni and multicellular eukaryotes that cause disease) emerging and spreading quickly around the world due to lack of population immunity. Once the pathogen emerges it will be important to understand the spread, transmission, symptoms, severity, immunity, treatments and healthcare pathways.



The reasonable worst-case scenario is an unmitigated pandemic with an unassumed transmission route and a high attack rate, with 4% of symptomatic infections requiring hospital care and a case fatality ratio of 2.5%. It may come in single or multiple waves. Wave number depends on the characteristics of the disease, public behaviour, and government intervention. The RWCS assumes 50% of the UK's population fall ill during the whole course of the pandemic, with around 1.34 million people requiring hospital treatment and approximately 840,000 deaths.

Impact Dimension	Overall Score	Total Score
Behavioural	5	10/10
Economy	5	5/5
Environment	0	0/5
Essential Services	5	35/45
Human Welfare	5	30/35
International Order	5	10/25
Security	5	13/20
Final Impact Score	**5**	**103/145**

Key assumptions

Each pandemic is unique and will be impossible to predict when it will occur. Impacts on society depend on many different factors - transmission route, severity of disease, global travel and distribution of morbidity and mortality. The RWCS is an unmitigated pandemic and does not assume that behaviour change or government interventions are successful at reducing transmission.

Variations

Each pandemic and the characteristics of the pathogen, its transmission route, where and the time of year it emerges, and its impact on society are different. Variations include a novel enterovirus pandemic, a novel coronavirus pandemic and novel sexually transmitted infection pandemic.

Response capability requirements

Disease surveillance and early detection, including timely and reliable data is needed. There should be procedures to support the identification and isolation of suspected cases and scalable contact tracing, as well as rapid development and procurement of pharmaceutical countermeasures with stockpiled countermeasures for known pandemic threats. Local and national plans for managing excess deaths should be present, and arrangements for effective UK and global coordination. Plans for social, educational, and economic impacts of the pandemic and scientific and clinical advice should also be in place.

Recovery

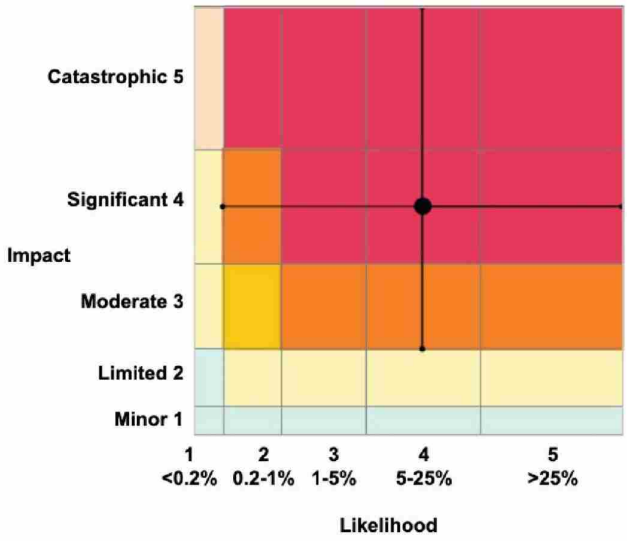
It may take years for recovery to health and social care (due to increased pressure on them throughout the pandemic) and impacts on society, education and the economy may last several years. Recovery from one wave of the pandemic may be hampered by the arrival of a subsequent wave of the same pandemic.

Outbreak of an emerging infectious disease

R79 - DHSC

Description (scenario)

The scenario is based on a novel respiratory-transmitted virus that emerges zoonotically in another country and causes a regional epidemic in that country. The scenario covers diverse zoonotic virus families, which may acquire some degree of human-to-human transmission, such as zoonotic influenza viruses, coronaviruses and nipah viruses.



There are up to 10 imported cases into the UK before border measures are applied. The pathogen is previously unknown or not normally found within the UK, resulting in an outbreak of up to 2,000 cases with a case fatality rate of 25%. Up to 200,000 contacts need to be traced and isolated or monitored depending on exposure. Non-pharmaceutical interventions, rapid isolation and contact tracing activities following the initial border measures, and limited transmissibility of the virus bring the outbreak under control. Failure to contain the outbreak would result in a large epidemic in the UK or a pandemic, which is covered under a separate risk in the NSRA. Infected individuals show identifiable and visible symptoms at the same time as, or preceding, the risk of transmission. The outbreak lasts between 2 and 6 months.

Impact Dimension	Overall Score	Total Score
Behavioural	4	7/10
Economy	5	5/5
Environment	0	0/5
Essential Services	5	17/45
Human Welfare	4	10/35
International Order	1	4/25
Security	3	5/20
Final Impact Score	**4**	**48/145**

Key assumptions

The novel pathogen causing the epidemic emerges abroad and there is no effective treatment or vaccine. Infection is transmitted by the respiratory route. There is limited human-human transmissibility but there is a high case fatality rate. The outbreak is contained regionally.

Variations

There are a range of different transmission routes and disease severities, reflected in the variations of a viral haemorrhagic fever, vector-borne disease and zoonotic infection.

Response capability requirements

The capability response focuses on containment (stopping further transmission and reducing cases to zero). This includes quickly implementing appropriate border measures, with a focus on isolation capabilities, disease surveillance and early detection. There will be a need for personal protective equipment supplies, scalable testing and decontamination services in place to prevent cases from rising. A national communications plan is needed to increase awareness and encourage good hygiene.

Recovery

Long term impacts will not be understood until several months or up to years later with possible long-term consequences on the health and social care system.