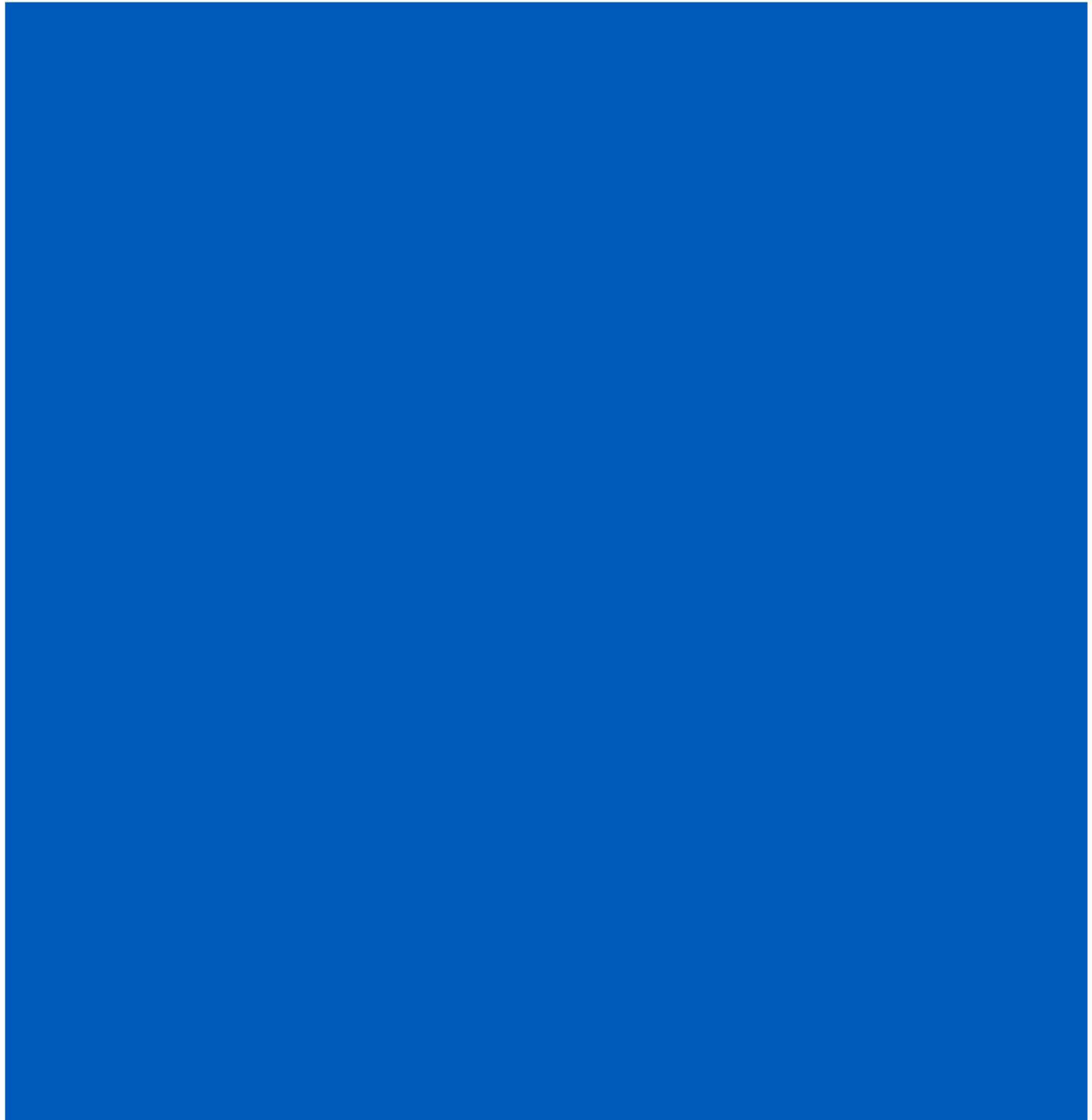




Cabinet Office

National Risk Register Of Civil Emergencies

2017 edition



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Foreword

The United Kingdom has an enviable reputation for resilience. In a rapidly changing world, we are at the forefront of embracing new opportunities and seeking innovative solutions to emerging problems. Our openness and integration of technological developments brings us huge benefits but also introduces risks and vulnerabilities. As such, resilience is crucial to protecting our people and businesses, and through them our society and economy.



Resilience does not come easily but the UK has long experience. Call it what you will, but whether through the fabled 'stiff upper lip', 'Blitz spirit' or just a stubborn determination, our resilience can be seen at the forefront of our handling of emergencies. Within Government, this is based on robust risk management and tried and tested emergency response and recovery arrangements. At the front lines of an emergency, it is based on the unparalleled dedication and selflessness of our emergency services. Throughout society it is based on the many volunteers and charities who provide so much, and most especially on the individual; on you. The risks in this document may seem beyond your control but your response to them is not. Being better prepared will make a huge difference even in the face of adversity.

The 2017 National Risk Register provides an overview of the key risks that have the potential to cause significant disruption in the UK. This document explains the types of emergencies that might occur, what the Government and partners are doing to mitigate them, and how you as individuals, families or small businesses can help to protect yourself.

We have made the National Risk Register more robust, informative and accessible than ever before. When compiling the document we have drawn on the support of Government Departments, Devolved Administrations, local resilience practitioners and many external partners, including universities and industry. It is only with that help that we are able to produce robust and credible assessments and prepare ourselves for the challenges we face.

It is an unfortunate fact of life that emergencies do happen. However our awareness, preparedness, readiness and response to those emergencies is very much in our own hands. I encourage you to consider that as you read this document.



Caroline Nokes MP

Minister for Government Resilience and Efficiency

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CHAPTER 1 -

INTRODUCTION

Purpose

Emergencies are a fact of life throughout the world and can take many forms. In the UK, we are fortunate that our environment and climate are relatively calm and stable, but we still face some risks that could cause serious disruption to peoples' day to day lives.

Alongside emergency services and local authorities, the Government has an important role to play in identifying, assessing, preparing for and dealing with emergencies, from flooding and severe storms to industrial accidents or terrorist attacks.

In addition to everything the emergency services and other authorities do to manage risks, there are also sensible precautions that you can take to help protect yourself. These include being aware of risks and understanding what you can do individually, or as part of your business or community to prepare for them.

There are some events that could cause widespread damage and would require some form of Government response. The Government produces this document, the *National Risk Register of Civil Emergencies* (NRR) to give information to the public about these risks, alongside advice and guidance on how you can prepare for them.

The NRR is based on information from the *National Risk Assessment*, which is a classified assessment of risks that could happen in the UK over the next five years. Both products help the Government and local authorities to inform, plan and prepare.

Synopsis

Chapter 1 explains what risks are included and how the NRR works. Diagrams in Chapter 1 (referred to as 'Risk Matrices') compare a sample of emergencies based on how likely they are and the severity of their likely effects on society.

Chapter 2 describes how you might be affected by the consequences of an emergency (such as transport disruption or power loss), along with simple actions that will help protect and prepare you, your family and your business if they happen.

Chapter 3 goes into more detail about each of the risks and how the Government and others prepare for and manage them. These pages also contain further information and resources to help individuals, businesses and communities to plan for specific emergencies.

Chapter 4 briefly outlines the methodology used to identify, assess and prioritise risks.

Is this document online?

Yes. An online version of the NRR can be [found here](#).¹

Where else can I find information?

Other useful sources of information include:

- For risks that are **most relevant to your local area**, your Community Risk Register can be [found here](#). These are available from local authorities and are published by Local Resilience Forums in England and Wales, and Regional Resilience Partnerships in Scotland. They provide a brief overview of significant risks based on local conditions, infrastructure and geography. Page 70 has more information on local arrangements.
- For guidance on the **consequences of emergencies for businesses**, please refer to the [Business Resilience Planning Assumptions](#).
- For **resilience training and qualifications**, please refer to the [Emergency Planning College website](#). The College helps train resilience planners from across the UK.
- For information specific to **your part of the UK**, please refer also to the resilience websites of [Scotland](#), [Wales](#) or [Northern Ireland](#). Sections of this document also include relevant links.

What is a civil emergency?

Emergencies can take many forms. Most emergencies will be dealt with by local authorities without the involvement of central Government. However, there are some events which, if they happened, would have a serious effect on the security of the UK, its people or the environment in which we live. These risks are considered to be 'civil emergency' risks and are defined further in the *Civil Contingencies Act 2004* ([linked here](#)).

Every two years the UK Government produces an assessment of the risks facing the UK that could cause a civil emergency. These risks are written in the form of scenarios or events, such as a severe storm or a disease outbreak. The seriousness of any risk depends on two things: (a) how likely it is that the risk will occur; and (b) the expected impacts were it to happen. Government considers both of these factors when assessing a risk scenario.

The NRR is not a list of every harmful event that might occur. The NRR only considers events where there is evidence to suggest that it could plausibly happen within the next five years and where the consequences of that event would cause a civil emergency.

The risk matrices

A risk matrix illustrates at a glance the relative effects and likelihood of different risks. The two matrices on pages 9 and 10 illustrate a selection of risks that could lead to a civil emergency: one for natural hazards, accidents, diseases and societal risks; the other for malicious attack risks (e.g. conducted by terrorists). Some risks on the matrices contain multiple individual scenarios, each of which would cause different kinds or levels of damage. These have been condensed into summarised categories. Icons on the matrices represent the overall likelihood or impact of that risk category.

¹ <https://www.gov.uk/government/collections/national-risk-register-of-civil-emergencies>

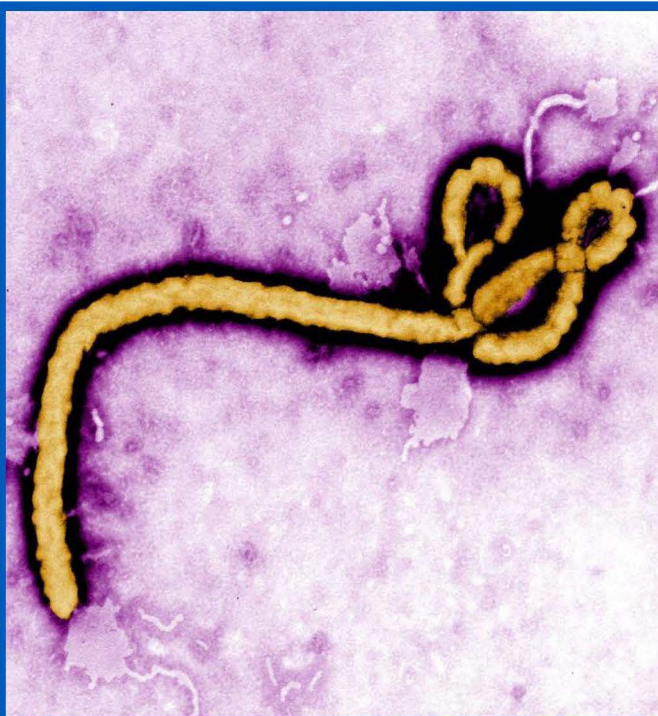
How have the risks changed?

The Government's assessment of risks is based on a continuous cycle of learning lessons from real events, drawing on new scientific or technical evidence and improving the way in which we calculate the likelihood and potential impacts (consequences) of risks. Each NRR therefore improves upon the last one and updates the Government's understanding of risks. Previous editions can be [found here](#).

The Government's assessment of some of the risks in the 2017 NRR has changed since the previous NRR was published in 2015. In some cases the changes are the result of new or better modelling which improves Government's understanding of the risk scenarios. In other cases, amendments reflect the changing world in which we live. Some examples of changed risks are included below.

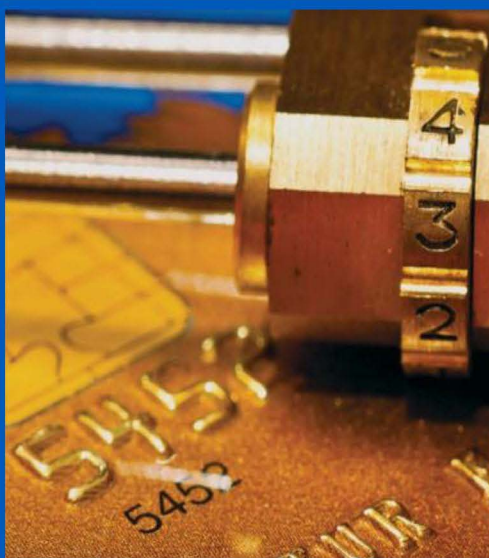
Emerging infectious diseases

The emergence of new infectious diseases is unpredictable but evidence indicates it may become more frequent. This may be linked to a number of factors such as: climate change; the increase in world travel; greater movement and displacement of people resulting from war; the global transport of food and intensive food production methods; humans encroaching on the habitat of wild animals; and better detection systems that spot new diseases. No country is immune to an infectious disease in another part of the world. In light of evidence from recent emerging infectious diseases such as Ebola and Zika, the likelihood of this risk has increased since 2015.



Cyber attacks

The UK now faces an increasing number of state and non-state groups with the ability and desire to carry out attacks using cyberspace. Some try to steal data or money, others seek to spy, draw attention to a cause or otherwise disrupt government, society and individuals by preventing things from working. With the increasing connectivity of digital systems, cyber attacks are growing more frequent and sophisticated, and more damaging when they succeed. The Government assesses the risk of cyber attacks has increased since 2015 and it is likely that the number and severity of cyber incidents affecting public and private sector organisations will continue to increase.



Long-term trends

This document covers very severe risks that could affect the UK within the next five years. In addition there are a variety of longer-term trends that are likely, over the coming decades, to change the overall risk landscape. These trends could make the risks we currently face more severe or more likely. In time they could also lead to the emergence of completely new risks.

Antimicrobial resistance (AMR)

AMR is a term to describe the process where drugs are no longer effective in treating infections caused by micro-organisms such as bacteria, viruses or parasites. Without effective antibiotics even minor surgery and routine operations could become high-risk procedures, leading to prolonged illnesses and higher numbers of deaths. The number of antibiotic-resistant infections is expected to increase markedly over the next 20 years.

AMR is a global problem and the UK helped lead international efforts to tackle it. These efforts have focused on activity via multilateral forums and international agencies such as the World Health Organisation, G7, G20,² and the United Nations itself. On 21 September 2016, 193 Member States adopted a UN Declaration on AMR, ensuring widespread global acknowledgement of the risk.

In 2014, the Government commissioned an independent, global-facing review of AMR led by Lord O'Neill of Gatley, who published his [report](#) in September 2016. The Government made a number of commitments in [response](#) to the AMR review that will enable the UK to continue to lead the global fight against AMR, e.g. by limiting the inappropriate use of antibiotics.



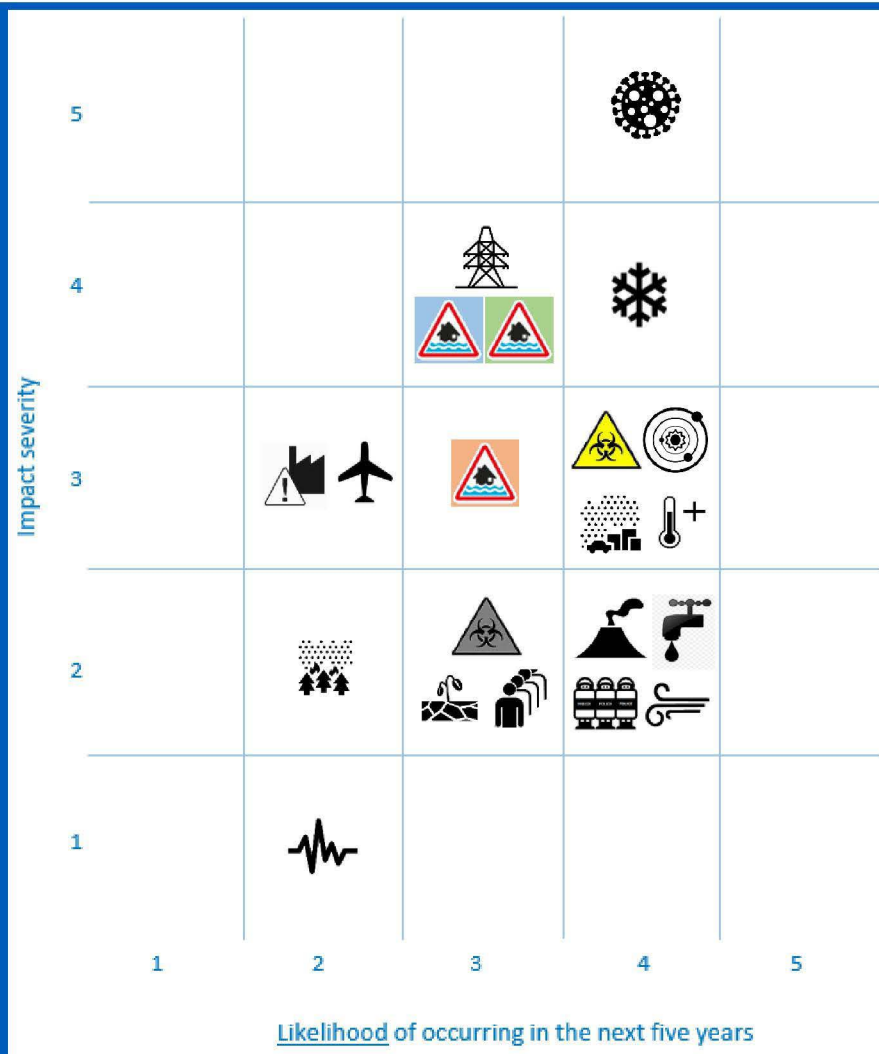
Climate change

Climate change is not only a future challenge. Experts are already observing changes in the UK's climate, with average temperatures having risen by around 1°C over the last century. As well as a trend towards warmer winters and hotter summers, sea levels around the UK's coast are rising by around 3 mm a year and there is evidence of changing rainfall patterns. Heavy rainfall and flooding, such as the UK saw over the winter of 2015/16, illustrate the costs and disruption that can be caused by extreme weather. The Adaptation Sub-Committee of the Committee on Climate Change highlighted six thematic risks for the UK.³ The top two priorities were: flooding and risks associated with coastal changes; and risks to health, well-being and productivity from high temperatures. The NRR provides information on both flooding (page 17) and heatwaves (page 20) as potential civil emergencies.

² The 'Group of 7' and 'Group of 20' major advanced economies, respectively.

³ Committee on Climate Change (2016): *UK Climate Change Risk Assessment 2017 - Synthesis Report*

Matrix A - Hazards, diseases, accidents, and societal risks



KEY

Natural hazards

- Coastal flooding
- River flooding
- Surface water flooding
- Storms and gales
- Cold and snow
- Heatwave
- Drought
- Space weather
- Volcanic eruptions
- Poor air quality
- Earthquakes
- Wildfires

Diseases

- Pandemic influenza
- Emerging infectious disease
- Animal disease

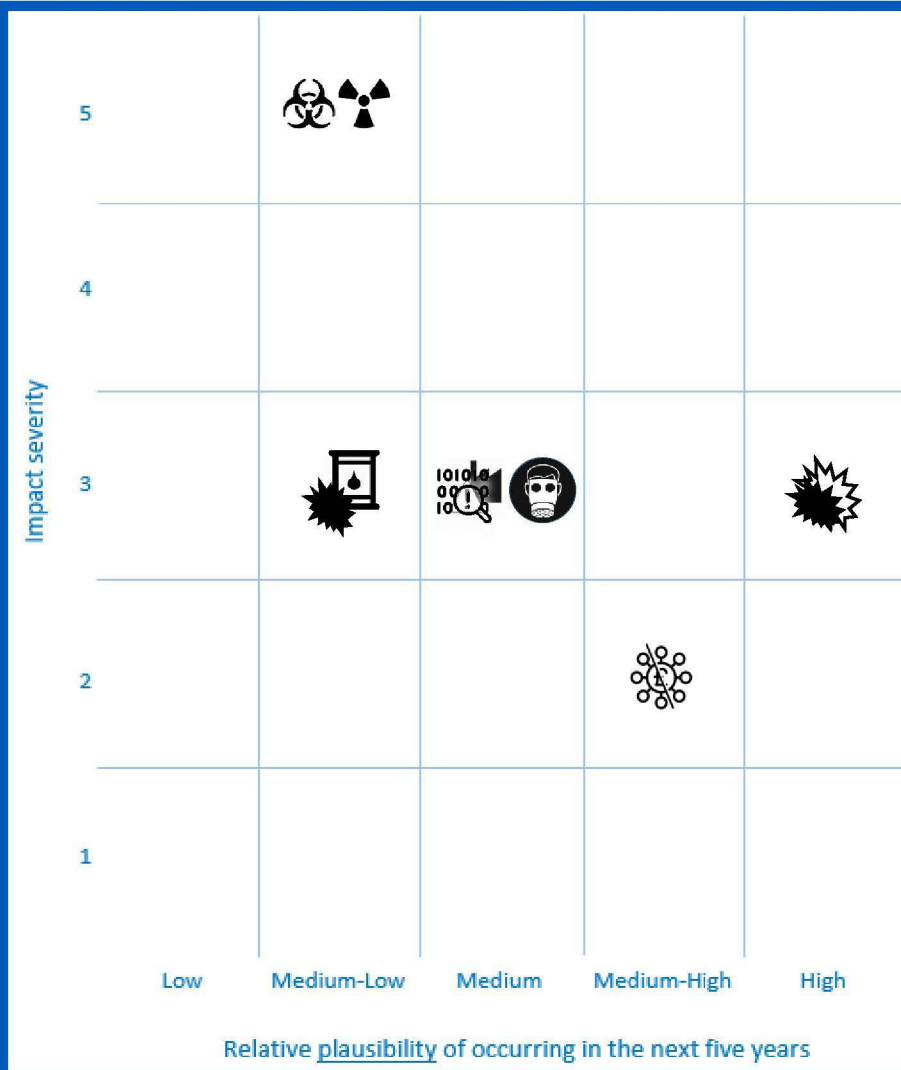
Major accidents

- Widespread electricity failure
- Transport accidents
- Industrial and urban accidents
- System failures

Societal risks

- Industrial action
- Public disorder

Matrix B - Malicious attack risks



KEY

Malicious attacks

- Attacks on crowded places
- Attacks on transport
- Attacks on infrastructure
- Cyber attacks on infrastructure
- Cyber attacks on services
- Larger-scale chemical, biological, radiological or nuclear attacks
- Smaller-scale chemical, biological or radiological attacks

CHAPTER 2 -

BE PREPARED



This chapter will demonstrate the likely consequences in the event that emergencies like those explained in this document were to happen. It will then describe some simple actions that you might consider taking to better protect you, your family, your home and your business.

What would you do in the event of...



Temporary closures
of **work, school** or
nursery?



Roads, bridges or
public transport
being unavailable
to use?



Physical damage
or **flooding** to your
home or business?



Having to **leave**
your home or
business to stay in
temporary
accommodation?



An **electricity**
blackout or **loss**
of other utilities,
such as fuel, water
or gas?



Having your
personal
information **stolen**
or **corrupted**
online?



A risk to you or
your family's **health**
from **extreme**
temperatures or
disease?



Being caught up in
a **terrorist attack**
involving
firearms?



Being caught up in
an environment
contaminated by
hazardous
materials?

To protect yourself, your family and your business, you might consider...

Be Aware



Know your local risks; read your Community Risk Register



Consider signing up for **weather** and **flood alerts**



Be aware of your surroundings; report unattended packages or suspicious behaviour

Prepare



Keep up to date with **vaccinations**



Know where **key documents** and **medications** are so you can leave quickly



Consider the right **insurance** for your home and business, and **travel insurance** when abroad



Protect yourself online. Be [Cyber Aware](#)



Consider having **basic supplies** at home, like bottled water, a torch and batteries



Consider backup **childcare** and check what your **child's school** plans to do during emergencies

Respond



If you are caught up near gunfire; **Run. Hide. Tell.**



If instructed, or if you are unsure what to do; **Go in. Stay in. Tune in.**



In an emergency **dial 999**

CHAPTER 3 -

RISKS



This chapter provides more detail about individual risks and some of the resources you can use to help you in the event of an emergency, including whilst you are abroad. For each risk, we have provided information about the likely consequences of that risk and the actions that Government takes to prepare for them. Further information to help individuals, businesses and communities to plan for emergencies is included at the bottom of each section, including helplines and hyperlinks to other websites.

XYZ

← Hyperlink buttons can be clicked when online for more information.



Risks in foreign countries

This document is based on an assessment of risks happening within or affecting the UK. However, all of the risks detailed in the following pages could potentially affect you when travelling or living abroad, whether for work or leisure. Depending on the foreign country, you may experience different levels of response and/or assistance from local authorities. Some risks will also be more likely or more severe in certain countries.

Particularly severe incidents which could require a crisis response include:

- **civil or political unrest**, of such severity that the Foreign and Commonwealth Office may advise you to leave the country;
- events which cause **disruption and hardship to large numbers of British people**, such as volcanic ash, the collapse of travel companies and major airport shutdowns; and
- an incident in which **large numbers of British people are or could be killed or injured**. This includes conflict, terrorism, major transport incidents, major disease outbreaks and natural disasters such as earthquakes, hurricanes and tsunamis.

How does this affect me?

If you are British, a dual national or the immediate family of a British person, you are eligible to ask for consular assistance if you are affected by a crisis abroad. You are responsible for your own personal safety and should read and follow the advice provided by the UK Government and local authorities in the country you are visiting. In some circumstances, there will be limits to the assistance that the Government can provide, e.g. where it would involve sending staff into a situation where their safety could be at risk.

What you should do...

In all cases it is sensible to check the Foreign and Commonwealth Office's travel advice, sign up for updates by email alerts and ensure you have any necessary travel insurance before you go. If an incident does occur abroad, follow the advice or directives of local authorities in the first instance.

Twitter - Check the Foreign and Commonwealth Office travel feed



@FCOtravel

Further information online - hyperlinks below

British Nationals
Abroad – FCO
Guide

Travel advice and
updates regarding
your destination

General support
and advice

Consider taking
out travel
insurance

An aerial photograph of a river delta, showing a complex network of channels and distributaries. The water is a mix of dark blue and white, indicating varying depths and currents. A semi-transparent blue rectangular box is overlaid on the upper right portion of the image, containing the text 'NATURAL HAZARDS' in white, italicized, uppercase letters.

NATURAL HAZARDS



Flooding

What's the risk?

There are three types of flooding considered within this document:⁴

- **coastal** (where high tides and storm surges combine to cause the sea to flood inland);
- **rivers and streams**, known as 'fluvial flooding' (where waterways overflow their banks into surrounding areas); and
- **surface water** (where rainfall overwhelms drainage systems).

All three forms could happen in different locations across the UK at the same time. Some flood risks are tied to specific geographic features such as coastline or flood plains, but surface water flooding can occur in a wide variety of locations including towns or cities far from the sea or rivers. Surface water flooding is also particularly difficult to forecast and can happen at very short notice. When flooding occurs, infrastructure (e.g. bridges) or flood defences can sometimes be overwhelmed with little, if any, notice, leading to additional disruption.

Consequences of flooding may include:

- **fatalities** and physical / psychological **casualties**;
- **evacuation** and long-term **shelter** of residents or employees;
- widespread **damage** to property and infrastructure;
- **disruption** to essential services, particularly transport and energy; and
- **environmental damage** or **contamination** (particularly by sewage).

Has this happened before?

Yes. The winter of 2015/2016 was the second wettest winter on record and a series of storms (including 'Desmond' and 'Eva') resulted in heavy and sustained rainfall. 17,600 UK properties were flooded and several bridges collapsed, disrupting access to and from local communities. 61,000 people lost power due to flooding in the Lancaster area. Economic damage was estimated to be about £1.6 billion.

What's being done about the risk?

Reducing vulnerability

- **Permanent defences** - the Government is investing £2.5 billion over six years (2015 to 2021) in England to build 1,500 new flood defence schemes, which will better protect more than 300,000 homes. Scotland is also investing £420 million over ten years (2017 to 2027), with 42 Flood Protection Schemes or engineering works scheduled to begin between 2016 and 2021 to improve protection for 10,000 homes. In Wales, £144 million will be invested in managing flood risk over five years (2016 to 2021).

⁴ A fourth type also exists termed groundwater flooding. This happens when the level of water within the rock or soil that makes up the land surface (known as the water table) rises, such as due to persistent rainfall. More information is available [here](#).

- **Temporary defences** - the Environment Agency has invested in 32 kilometres of temporary barriers which can be transported to protect places in particular need.
- **Resilient construction** - increasing numbers of new construction projects have flood resilience designed in from the outset.
- **Managing water flow** - the Government employs strategic use of dredging, reservoirs and barriers to reduce flood risks.
- **Using the local environment** - the Government is supporting investment in the use of natural flood measures such as tree planting to slow down the flow of water.

Better predictions

- Sophisticated **monitoring and forecasting** systems, (see Flood Forecasting Centres below), are used to anticipate flooding and provide early warning to areas likely to be affected.
- The [National Flood Resilience Review](#) has improved the Government's understanding of some of the worst plausible scenarios for coastal and river flooding.

Improved coordination

- The **Flood Risk Management Programme** aims to reduce the likelihood and effects of flooding in England. Similar activity is conducted by all devolved administrations.
- **Flood Forecasting Centres** are partnerships between the Met Office and the [Environment Agency](#) (in England, alongside close collaboration and financial support from Natural Resources Wales), and the [Scottish Environment Protection Agency](#). These bring together expertise on flood monitoring, forecasting and warnings. The Department for Infrastructure in Northern Ireland also works closely with the Met Office in managing flood risks.
- Local Resilience Forums in England and Wales, Regional Resilience Partnerships in Scotland and Emergency Preparedness Groups in Northern Ireland **assess risks, develop contingency plans** and **review them**.

Storm Surges

Low atmospheric pressure allows the sea's surface to bulge upwards in what is called a 'storm surge'. If strong persistent onshore winds occur, these increase the height of the surge and generate waves that can damage the coastline. Surges can occur at any point on the tidal cycle; at low tide they rarely cause flooding but at high tide the resulting flooding can be significant.



What you should do...

The Met Office, Environment Agency, Scottish Environment Protection Agency, Natural Resources Wales and the Northern Ireland Department for Infrastructure, as well as local authorities around the UK all work hard to manage flood risks. You can take advantage of a variety of free, easy-to-use tools to help stay informed and protect yourself, your family, your property and your business.

Online - Flood Information Services - Live alerts by postcode in [England / Wales](#), and [Scotland](#)

Telephone - Call the 24/7 Floodline - What to do before, during and after flooding



(England, Wales and Scotland)

0345 988 1188



(Northern Ireland)

0300 2000 100

Flooding on the Somerset Levels, England, 2 February 2014



Further information online - hyperlinks below

Sign up for flood alerts by phone, text or email

Health guidance and advice

Check your local flood risk

Flood defences and coastal change

Key flooding organisations by nation

England

Scotland

Wales

Northern Ireland



Severe weather

What's the risk?

The UK sits in the path of predominately westerly winds where low pressure weather systems, (and associated clouds and rain) frequently move eastwards or north-eastwards across the North Atlantic and then across the UK. This brings unsettled and windy weather, particularly in winter. Summers in the UK are usually cooler than those on the European continent whereas our winters are often much milder. However, experts anticipate that climate change will alter the UK's weather, leading to changes in patterns of rainfall and temperature. This has the potential to cause more frequent extreme weather events.

The Government assesses the risk from four main types of severe weather:

- **storms and gales** with damaging wind speeds and possible lightning;
- **low (sub-zero) temperatures and heavy snow** for prolonged periods;
- **heatwaves** with high temperatures lasting several weeks, harming peoples' health; and
- **drought** as a result of a lack of rainfall over several years, leading to water shortages.

Consequences of these events may include:

- **fatalities** and physical **casualties**, particularly among vulnerable groups (e.g. the elderly);
- some **evacuation** of residents or employees;
- **damage** to property and infrastructure, directly and via land instability (e.g. landslides);
- **disruption** to essential services, particularly transport, energy and communications;
- additional pressure on **healthcare**; and
- **environmental damage**.

Have these things happened before?

Yes. A storm on 16 October 1987 brought down 15 million trees in south-east England and caused dozens of deaths. The 'Burns Day' storm on 25 January 1990 killed 47 people across the British Isles. The 'St Jude's Day' storm on 28 October 2013 caused four deaths as a result of falling trees, severe disruption to transport and left more than 850,000 homes without electricity. The October storms caused significantly more damage to trees as they still held their leaves, making it easier for strong winds to damage or uproot them.

In February 2001, heavy snow and strong winds caused travel disruption for up to five days and brought down power lines across Northern Ireland. The most widespread and prolonged low temperatures and heavy snow in recent years occurred from December 2009 to January 2010. Daytime temperatures were mostly sub-zero across the UK. At night, temperatures in England, Wales and Northern Ireland regularly fell to -5°C to -10°C, while in Scotland (in the Highland glens) temperatures fell to -15°C or lower. Snowfall across the UK lasted for some time, allowing 20cm to 30cm of snow to build up, closing schools and making it very difficult to travel.

In August 1990, the UK experienced heatwave conditions with temperatures reaching what was then a record 37.1°C in Cheltenham, England. In August 2003 a UK heatwave lasted 10 days and resulted in over 2,000 deaths. Temperatures reached what was then a record 38.5°C in Faversham, England and 33°C in Anglesey, Wales. High temperature records are now being broken with increasing frequency.

Over the past 40 years or so England has experienced five long-duration droughts and two shorter periods of drought. Drought in the other UK nations is rare. During the 2010-12 drought, parts of south-east and eastern England recorded their lowest 18 month rainfall total in over 100 years. 20 million customers were given temporary hosepipe bans and the environment / agricultural sectors were disrupted. Drought has the longest advance warning times of the severe weather types.

What's being done about the risk?

Forecasting

- The **Met Office** provides 24/7 weather coverage and forecasting across the UK.
- The Environment Agency, Scottish Environment Protection Agency, Natural Resources Wales and the Northern Ireland Department for Infrastructure work hard to predict, monitor and provide early warning on severe weather. Links to information sources are at the bottom of the next page.

Publicly-available guidance

- **Warnings** - the Met Office uses a colour-coded system to show the likelihood and effects of expected severe weather.
- **High temperatures** - [‘Heat-Health Watch’](#) in England provides an alerting service between 1 June and 15 September each year, issuing tailored advice when temperatures are expected to rise significantly. Advice and guidance for each UK nation is available below.
- **Cold weather** - [‘Cold Weather Alerts’](#) in England provide a service between 1 November and 31 March each year, issuing alerts when the average temperature is forecast to fall below a certain level and/or for forecasted heavy snow or widespread ice. Advice and guidance for each UK nation is available below. Additional cold weather guidance for Wales is also available [here](#).
- **Campaigns** - Government public information campaigns such as ‘Get ready for winter’ and ‘Ready Scotland’ give tailored advice, particularly for vulnerable people. The public health agencies in each UK nation may also employ bespoke campaigns during severe weather events.

Regulation, legislation and planning

- **Severe weather planning and response** - local and central Government work with infrastructure operators and emergency responders to develop response plans to deal with potential damage and restore utilities and travel routes as quickly as possible.
- **Drought planning** - water companies have a statutory duty to plan for drought. Plans include a range of actions to manage the supply and demand of water. The Environment Agency also has a drought response framework which sets out how the Agency works with Government, water companies and others to manage water resources during a drought in England. Natural Resources Wales maintains plans for dealing with droughts in Wales.
- **Emergency Drought Orders** - legislative orders can be issued to restrict water usage if required.

Heavy snow on Snowdon/Yr Wyddfa, Wales, 25 December 2010; seen from Carnedd y Cribau



What you should do...

Simple actions that can help keep you, your family and your business safe from severe weather are illustrated as part of the overall guidance in Chapter 2 and particularly within the links below.

Telephone – For more information via phone, call the 24/7 Met Office Weather Desk



Weather Desk (UK-wide)
0370 900 0100

Further information online - hyperlinks below

[UK severe weather warnings](#)

[Severe weather warning impact tables](#)

[Community resilience](#)

[Driving in adverse weather](#)

Heatwave advice

[England](#)

[Scotland](#)

[Wales](#)

[Northern Ireland](#)

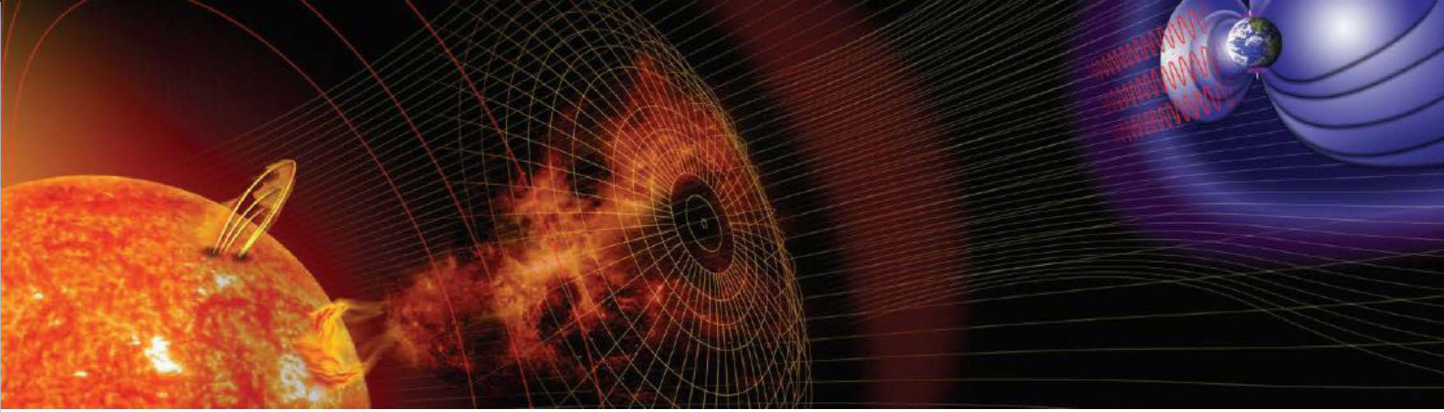
Winter is coming... prepare yourself

[United Kingdom](#)

[Scotland](#)

[Wales](#)

[Northern Ireland](#)



Space weather

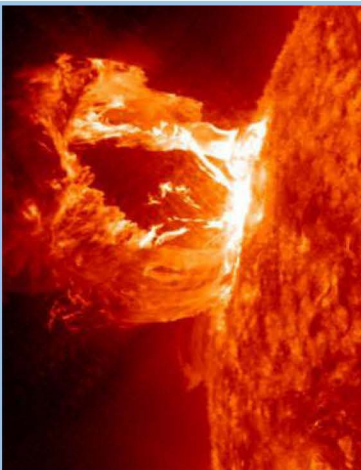
What's the risk?

Space weather is a collective term used to describe a series of phenomena originating from the Sun. There are three main types of space weather:

- **solar flares** which reach Earth within a few hours and can cause radio blackouts;
- **solar energetic particles** which travel somewhat slower and cause solar radiation storms, potentially harming astronauts if not forewarned; and
- **coronal mass ejections (CME)** which take up to four days to reach Earth and cause geomagnetic storms.

Consequences of these events may include:

- **electricity blackouts**, potentially causing **fatalities** and physical / psychological **casualties**;
- **loss / disruption** of Global Navigation Satellite Systems (e.g. GPS or Galileo);
- **disruption** to essential services, particularly air travel, energy and communications; and
- increases in **background radiation** doses high in the atmosphere and in space.



The Earth's core is largely molten iron and, as the Earth rotates, this creates a powerful magnetic field around our planet called the Magnetosphere. The Magnetosphere protects us from harmful radiation in the manner of a planetary shield. When solar flares, energetic particles or CMEs hit the Magnetosphere, this causes interference in the shield that disrupts technology, particularly electricity networks and services that rely on objects operating in space. Orbiting satellites are particularly vulnerable and can be damaged or temporarily disabled. Even if satellites continue to operate correctly, their signals may not reach the ground due to the effects of space weather.

Has this happened before?

Day-to-day space weather causes the *Aurora Borealis* ('the Northern Lights'), but much more severe events have occurred. The Carrington Event in 1859 is the largest space weather event on record. Telegraph systems were heavily disrupted and the *Aurora Borealis* was sighted as far south as Mexico, the Caribbean and Sub-Saharan Africa.

Other significant space weather events have been recorded since then. A Carrington-scale CME was measured by the Stereo-A satellite in July 2012. The path this took from the Sun narrowly missed the Earth. A smaller storm in 1989 tripped the equipment protection systems of the Hydro-Québec electricity network in Canada, resulting in a loss of power for nine hours across the province.

Another storm in 2003 caused the UK aviation sector to lose some GPS functions for a day. Records from solar storms in 1921 and 1960 describe widespread radio disruption and impacts on railway signalling and switching systems.

What's being done about the risk?

Pre-event

- **Understanding** - the Royal Academy of Engineering report on *Extreme Space Weather* (linked below) analysed potential impacts of space weather on the UK's infrastructure, and this is being used to inform measures to reduce the risk. The Department for Business, Energy and Industrial Strategy is also working with the electricity industry to understand exactly what might happen to the UK's electricity networks during space weather.
- **Strategy** - the Government's *Space Weather Preparedness Strategy* is linked below.
- **System hardening** - the relevant companies increasingly use better electronic shielding for satellites, new production regulations for electronic components and more resilient transformers in the electricity grid.

Forecasting

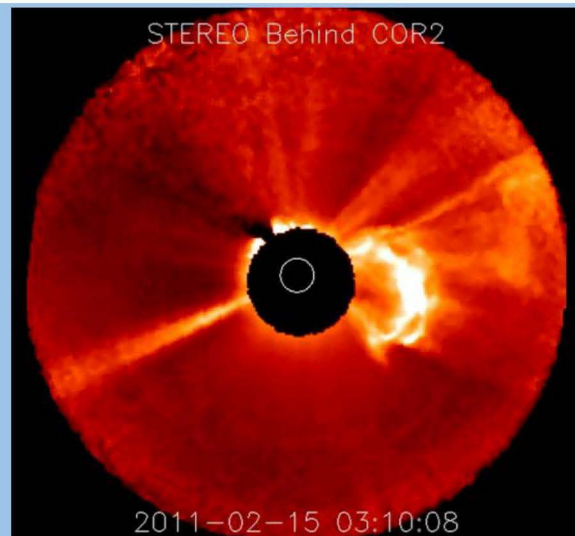
- **Forecasting by the UK** - the Met Office Space Weather Operations Centre provides a 24/7 forecasting service for a variety of space weather events.
- **Forecasting by partners** - the UK works closely with international partners to share information and knowledge.

Satellite Photography

The image to the right shows a coronal mass ejection (CME) leaving the Sun.

The Sun is the white circle in the middle of the image. The black disc obscures the Sun's brightest light to allow for the picture to be taken. The bright arc on the right is the CME.

The Earth is 100 times smaller than the white circle.



What you should do...

Relevant, harmful effects caused by a severe space weather event will be similar to those that happen if the UK electricity supply experiences a failure. Further information about this is covered on pages 40 to 43.

Further information online - [hyperlinks below](#)

Met Office –
What is space
weather?

Royal
Academy of
Engineering

Space weather
public
dialogue

Health
protection
guidance

Government
Preparedness
Strategy



Volcanic eruptions

What's the risk?

There are a range of volcanoes across Europe that could affect the UK, such as Santorini in the Aegean Sea and Vesuvius in Italy. However volcanoes in Iceland (such as Bárðarbunga and Eyjafjallajökull) are of most concern because they are close to the UK, erupt frequently and prevailing winds are more likely to blow ash and gas towards us.

Consequences of volcanic eruptions may include:

- **casualties** (from poor air quality);
- **disruption** to essential services, particularly transport;
- **economic damage** as disruption to air travel affects business and tourism; and
- **environmental contamination**, particularly to water and agriculture.



There are two distinct types of volcanic eruption. 'Explosive' eruptions happen when thick magma reaches the surface of the volcano. This prevents gases from escaping, which build in pressure until they eventually explode, blasting magma and rock into the atmosphere in a cloud of ash, gas and other particles. Volcanic ash clouds can affect jet engines and therefore disrupt air travel. The second type, 'effusive' eruptions, happen when large quantities of gases are able to escape freely. This can lead to long periods of air pollution affecting crops and people's health, particularly if they suffer from existing respiratory conditions.

Has this happened before?

Yes. In April 2010, a relatively small explosive eruption of Eyjafjallajökull in Iceland coincided with north-westerly winds, resulting in disruption to air travel across much of the UK and Northern Europe for six days. The 1783–84 Laki eruption from Grimsvötn in Iceland was an effusive eruption, releasing significant levels of sulphur dioxide, chlorine and fluorine over several months. This caused visible pollution across the UK and Northern Europe, mass crop failure and thousands of deaths.⁵

What's being done about the risk?

⁵ Witham, C., Aspinall, W., Braban, C., Hall, J., Loughlin, S., Schmidt, A., Vieno, M., Bealey, B., Hort, M., Ilyinskaya, E., Kentisbeer, J., Roberts, E., Rowe, E., 2015, 'UK Hazards from a Large Icelandic Effusive Eruption', Effusive Eruption Modelling Project Final Report

Pre-event

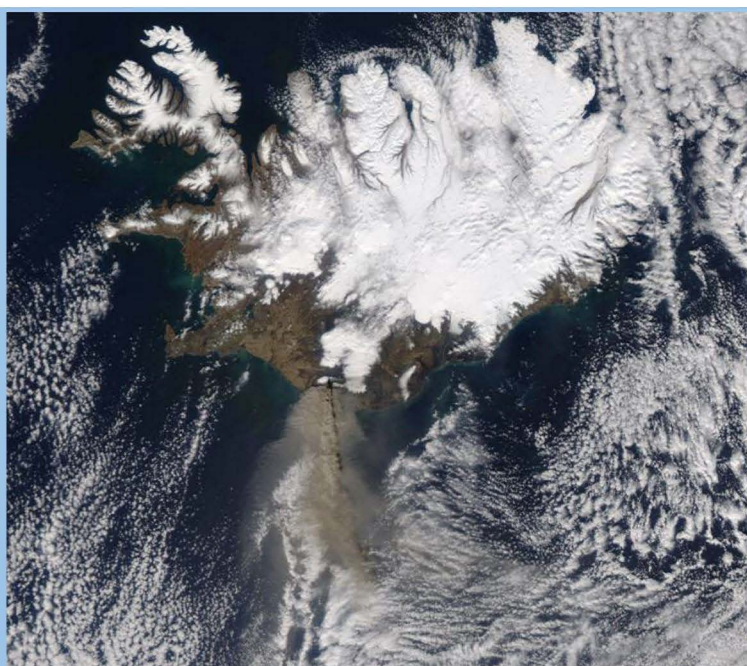
- **Collaboration** - the International Airways Volcano Watch consists of nine Volcanic Ash Advisory Centres located around the world. These centres provide information on the movement and spread of volcanic ash. The London centre covers Iceland and the Jan Mayen Islands, working closely with the Icelandic Met Office.
- **Improving understanding and a new regulatory regime** - the aviation industry and regulators have improved their understanding of volcanic eruptions and how best to deal with them. Better data on how ash interacts with jet engines has enabled a new regulatory regime to be put in place since 2010. This allows airlines to fly in low ash concentrations and (in consultation with their airframe and engine manufacturers) to submit a safety case to the Civil Aviation Authority to fly safely in medium and high ash zones.
- **Test aircraft** - there is now a permanent and specially equipped civil contingency aircraft for atmospheric testing in UK airspace that can be ready within 48 hours.

Eyjafjallajökull, Iceland

17 April 2010

The ash in this image is at two different altitudes. A concentrated plume rises over a more diffuse cloud below. Volcanic ash reached between 16,000 and 24,000 feet, according to the Icelandic Met Office.

Image & caption content courtesy of the National Aeronautics and Space Administration (NASA).



What you should do...

The health effects of this risk are covered under poor air quality, which can be found on the next page. If you are planning to fly in Northern Europe and there is significant news media activity around volcanoes, you can find helpful information and guidance on the London Volcanic Ash Advisory Service, linked below. Specific information on potential air closures and further information can be found on the Civil Aviation Authority website, also below. Consult your travel provider for information on individual flights.

[Further information online - hyperlinks below](#)

Volcanic Ash
Advisory
Service

Icelandic Met
Office

Global
Volcanism
Program

British
Geological
Survey

UK Civil
Aviation
Authority



Poor air quality

What's the risk?

Air quality has improved significantly over recent decades. However, more needs to be done to reduce air pollution to ensure a cleaner, healthier environment. Short-term surges in poor air quality occur primarily due to weather conditions preventing pollution from dispersing, such as low winds, or when a layer of warmer air traps colder air close to the ground (known as 'temperature inversion'). Air quality is also worsened by the ultraviolet light from sunshine, as it reacts with the air to generate ozone. Poor air quality is a risk to health, particularly for those with pre-existing heart and lung conditions, and especially among children and the elderly. Typical day to day air pollution is not within the scope of this risk.

Consequences of poor air quality may include:

- **fatalities** and physical **casualties**, principally by compounding pre-existing health conditions;
- **pressure on healthcare**, particularly hospital referrals and demands on ambulances;
- **economic damage**; and
- **environmental damage**

Has this happened before?

In 2006 the UK experienced two periods of extended hot weather with associated elevated ozone and harmful airborne particles. These occurred between 27 June and 7 July and between 13 and 23 July. In the first episode, the combination of heatwave conditions, poor air quality and associated exacerbation of mostly pre-existing conditions led to up to 540 deaths and up to 700 hospital admissions. The second episode led to up to 630 deaths and up to 830 hospital admissions due to the same combination of factors. In spring of 2015, two particle pollution episodes caused widespread poor air quality throughout the UK, with multiple areas measuring 'High' on the Daily Air Quality Index (which can be found [here](#)). Summer 2015 also contained two elevated ozone episodes.

What's being done about the risk?

Reducing likelihood

- **Reducing pollutants** - the Government regulates to control emissions and concentrations of harmful substances. In addition, the Government's revised air quality plan for tackling nitrogen dioxide (NO₂) emissions in urban areas can be found [here](#).

Reducing the impact

- **Forecasting** - air quality forecasting is provided daily for the entire UK (linked below).
- **Health advice** - Defra provides health advice associated with each step of the Daily Air Quality Index ([here](#)), in consultation with the Committee on the Medical Effects of Air Pollution (explained [here](#)). Tweets (# below) are also issued during periods of elevated pollution.

What you should do...

Poor air quality can be a risk to anyone with respiratory conditions (such as asthma) or cardiovascular conditions (such as heart trouble). If you think that you or a member of your family might be at risk, or if you or someone in your family has a history of experiencing particular problems with poor air quality, you should read the straightforward health advice on the Met Office and Department for Environment, Food and Rural Affairs websites (linked below). Those with pre-existing conditions should follow your doctor's usual advice about exercising and managing your condition, and take simple precautions like packing an extra inhaler.

You can check the daily pollution forecast (linked below) before you travel to get some advance warning of poor air quality. There are also telephone and Twitter services available.

Telephone - Air quality helpline (FREE)



United Kingdom

0800 556677

Twitter - Air quality feed



@Defraukair

Almaty, Kazakhstan

Dense accumulations of polluting aerosols at low altitude create an effect commonly known as 'smog'. Similar effects occur in numerous cities worldwide.



Further information online - hyperlinks below

Daily pollution
forecast

Met Office - Air
pollution effects

Defra - Air quality
plans

Where to find air
pollution
information

Public health organisations by nation

England

Scotland

Wales

Northern
Ireland



Earthquakes

What's the risk?

Earthquakes in the UK are moderately frequent but rarely result in large amounts of damage. An earthquake of sufficient intensity (determined on the basis of the earthquake's local effect on people and the environment) to inflict severe damage is unlikely. Damage from UK earthquakes is likely to be greatest in historic buildings such as churches, monuments and Victorian or Edwardian terraced housing.

Consequences of an earthquake may include:

- **fatalities** and physical / psychological **casualties**;
- potential **evacuation and shelter** of affected individuals;
- **damage** to property and infrastructure, particularly to older buildings; and
- minor **disruption** to essential services such as water or electricity.



The majority of the Earth's interior is made up of semi-molten rock, called the mantle. Floating above the mantle is the crust, on which we live. The crust is subject to enormous pressure and the resulting stresses cause rocks to break along lines of weakness known as faults. The largest of these form the boundaries between different pieces of crust called tectonic plates. When stresses exceed the friction holding rocks on either side of a fault together, they slide or slip past each other, releasing energy in radiating waves that cause the ground to shake. This is called an earthquake.

Earthquake activity is greatest at the major fault lines, which are far away from the UK. However, the stresses exerted at the edges of a plate still affect the plate's interior, so earthquakes can occur anywhere. These are referred to as intraplate earthquakes and are less frequent and typically smaller than those at plate boundaries.

Has this happened before?

Yes. A large earthquake occurred in 1931 near Dogger Bank, 60 miles off the east coast of England. The intensity of the earthquake was low, with buildings in Hull suffering only minor damage as the epicentre was a long way away. The largest UK earthquake in terms of intensity occurred in 1884 in Colchester, Essex. Approximately 1,200 buildings required repairs to collapsed walls, chimneys and roofs. On 28 April 2007 a very shallow earthquake occurred near Folkestone, Kent, resulting in power outages, transport disruption and widespread superficial damage. Other high-intensity earthquakes have occurred in the Dover Straits (in 1382 and 2007), south Wales (in 1727, 1775, 1832, 1868 and

1903), the Midlands (in 1816, 1924 and 1957), and Inverness (in 1816, 1890, and 1901).⁶

What's being done about the risk?

Regulations

- **Sensitive structures** - certain critical buildings such as power stations, nuclear sites, and buildings under the *Control of Major Accident Hazard* regulations are subject to earthquake-resistant design requirements alongside other existing obligations.

Studies

- **Seismic hazard studies** - studies are sometimes carried out for non-sensitive infrastructure projects (as opposed to those referenced under 'regulations'), alongside a safety statement.
- **Research** - research is ongoing into the nature and driving forces of UK earthquake activity.

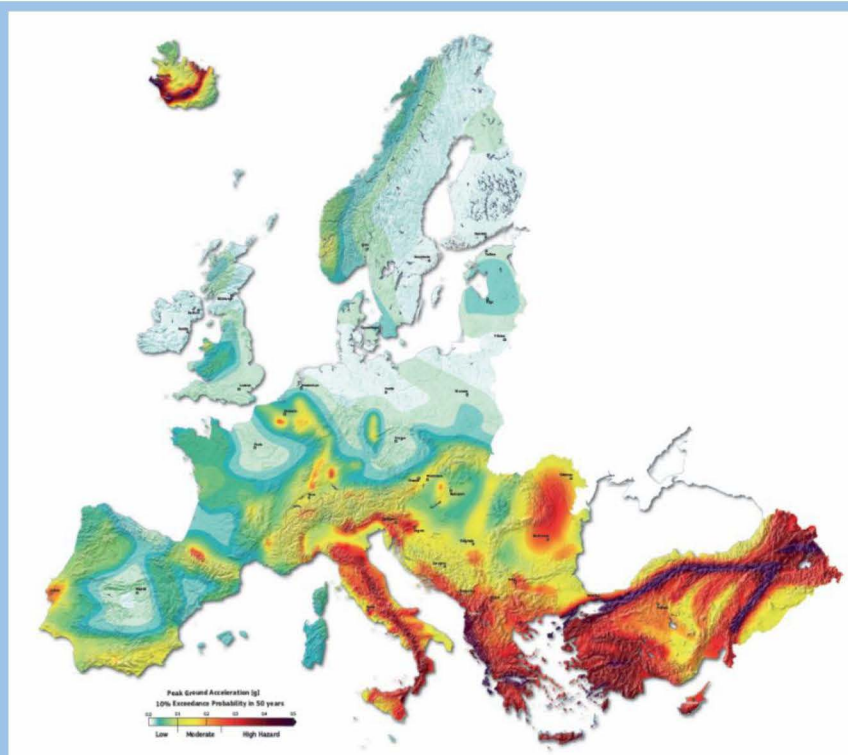
Forecasting

- Seismologists cannot currently predict when and where an earthquake will occur. However, some models of ground shaking can help plan for the effects and inform the design of buildings. Several such models and forecasts have been developed for the UK.

European seismic hazards

Blue to green shading represents areas of comparatively low hazard, yellow to orange shading represents areas of moderate hazard, and red to purple shading represents areas of high hazard.

Mapping courtesy of the Seismic Hazard Harmonisation in Europe project.⁷



Further information online - hyperlinks below

British Geological Survey

UK seismic hazard map

UK earthquakes in the last 50 days

Geo-hazard papers

⁶ Including those earthquakes that rated above a 7 on the European macro-seismic scale.

⁷ [10.12686/SED-00000001-SHARE](https://doi.org/10.12686/SED-00000001-SHARE), see also www.share-eu.org



Wildfires

What's the risk?

Wildfires can start for many reasons, including:

- **accidents** such as mishandled camp fires or barbecues;
- **human activity** such as use of weapons in military training areas;
- **malicious activity** such as fire-starting;
- **infrastructure incidents** such as sparks from electricity lines or rail transport; and
- **natural phenomena** such as lightning (although this is rare).

Hot, dry and windy weather are ideal conditions for wildfires to start and spread. Such weather tends to be relatively short-lived but is most likely to occur between March and May and between July and September. In years where there has been a significant drought the number of wildfires usually rises significantly. This risk is also affected by the availability and dryness of fuel (e.g. vegetation). Casualties from wildfires tend to be low but there are still psychological effects and other health consequences, such as breathing problems due to smoke or fume inhalation, which can particularly affect people with existing respiratory conditions. Disruption to services will depend on the location of the fire and whether it affects important infrastructure, but there is always a possibility of water contamination as ash and other burn residue dissolves into groundwater and reservoir supplies.

Consequences of wildfire may include:

- potential **fatalities** and physical / psychological **casualties**;
- potential **evacuation and shelter** of affected people;
- **damage** to property and infrastructure;
- minor **disruption** to essential services (particularly Fire and Rescue Services' availability); and
- **environmental damage, air pollution** and potential **water contamination**.

Has this happened before?

Yes. In April and May 2011 numerous wildfires broke out across the UK after unusually hot and dry weather. The UK as a whole received only 52% of its usual rainfall for April 2011, and England and Wales received only 21%. Wildfires affected (amongst other areas): West Yorkshire, Lancashire, Dorset and Berkshire in England; the Brecon Beacons in Wales; County Down, Tyrone and Armagh in Northern Ireland; and the north-west Highlands in Scotland. The fires particularly affected the water quality in Northern Ireland reservoirs. Climate change is likely to lead to changes in the rainfall patterns that affect the UK. If we experience longer drier summers, this will increase the risk of drought and could lead to more frequent, larger wildfires.

What's being done about the risk?

Forecasting

- **Fire Severity Index** - the Met Office provides this information for England and Wales, thereby informing an assessment of the likelihood and potential severity of wildfires.

Division of responsibilities

- **Home Office** - is Lead Government Department for Wildfires. The Fire and Rescue Service and Local Resilience Forums or equivalent (operating on a multi-agency basis to plan and prepare for local incidents and large-scale emergencies) consider the wildfire risks in their areas. Management of the vegetation which fuels wildfires sits with a variety of other departments depending on sector and geography.
- **Wildfire Forums** - the England and Wales Wildfire Forum, and Scottish Wildfire Forum (including Northern Ireland), are partnerships between: fire and rescue services, land management regulators and private organisations, Government, administrations, and researchers. This improves assessment, prevention, preparedness, response, and recovery.
- **Devolution** - the devolved administrations are responsible for the Fire and Rescue Services in Scotland, Wales and Northern Ireland.
- **Arson reduction** - to address persistently high levels of deliberately-set wildfires in Wales, a Strategic Arson Reduction Board brings together fire services, police, Welsh Government, Natural Resources Wales and others to co-ordinate prevention and response activities.

What you should do...

The Fire and Rescue Services throughout the UK stand ready to protect you, your family, your home and your business against a wide range of different fires, while working hard to prevent fires from starting in the first place. Scottish Fire and Rescue Service has a helpful guide for protecting your home or business against the risk of wildfires (linked below). This applies equally well across the UK.

For land owners, the Forestry Commission’s Practice Guide (linked below) can be used not only for forests and woodlands, but also high risk habitats such as grasslands, arable, mountain, moorland and heathlands. This guidance is also used for Defra’s ‘Countryside Stewardship’ applications and certain forestry Environmental Impact Assessments. Legitimate fires started for agricultural land clearance purposes should be closely monitored at all times.

To report a fire, always call 999 and ask for the fire services.

Some fires are started maliciously. This is a crime and any related activity should be reported to the police or other appropriate local authority. If you would prefer not to call the police, you can also report fire-starting activities to Crimestoppers. Both allow you to remain anonymous.

Telephone - To report malicious fire-starting activity, call the police non-emergency number



(United Kingdom)

101

Telephone - Alternatively, you can also call Crimestoppers



(United Kingdom)

0800 555 111

Further information online - [hyperlinks below](#)

Fire services -
wildfire
guidance

Fire safety
guidance

Wildfire
knowledge
exchange

Forestry
Commission
Practice Guide

Natural
Hazards
Partnership

DISEASES





Human diseases

What's the risk?

Human diseases take a variety of forms, some of which have the potential to cause a civil emergency due to the number of people they might affect in a short space of time. One such risk is an influenza ('flu') pandemic. Flu pandemics are natural events that happen when a unique flu virus evolves that few people (if any) are immune to. There are important differences between 'ordinary' seasonal flu of the kind that happens in winter, and pandemic flu. In a pandemic, the new virus will spread quickly and cause more serious illness in a large proportion of the population, due to the lack of immunity. There is a high probability of a flu pandemic occurring, but it is impossible to predict when, or exactly what it would be like.

Emerging infectious diseases could also cause large numbers of people to fall ill. These are diseases which have recently been recognised or where cases have increased over the last 20 years in a specific place or among a specific population (e.g. the Zika virus). The likelihood of an emerging infectious disease spreading within the UK is assessed to be lower than that of a flu pandemic.

Ways of catching these diseases can include:

- **respiratory** (airborne from one infected person to another);
- **vector-borne** (spread to humans via a third-party species, e.g. a mosquito);
- **blood-borne** (spread between humans via exposure to infected blood or blood products); and
- **food-borne** (spread by contaminated food/water).

It is difficult to forecast the spread and impact of a new flu strain or disease until it starts circulating. However, consequences may include:

- for **pandemic flu**:
 - up to 50% of the UK population experiencing symptoms, potentially leading to between 20,000 and 750,000 fatalities and high levels of absence from work.
- for **emerging infectious diseases**:
 - several thousand people experiencing symptoms, potentially leading to up to 100 fatalities.
- **disruption** to essential services, particularly health and education; and
- **economic disruption**, including disruption to business and tourism.

Has this happened before?

Yes. The most recent pandemic flu outbreak was an H1N1 strain ('Swine flu') in 2009 which caused at least 18,500 deaths worldwide. In 1918 another variant of the same H1N1 strain ('Spanish flu') killed over 50 million people globally. However, other flu strains exist with pandemic potential, such as H5N1 ('avian or bird flu'). This strain caused several hundred human deaths in South East Asia in 1996.

Over the past 25 years more than 30 new (or newly recognised) emerging infectious diseases have been identified around the world, such as Ebola, Zika and Middle East Respiratory Syndrome. The latter emerged recently in 2012 and poses a global health threat.

What's being done about the risk?

Pre-event

- **Planning** - the *UK Influenza Pandemic Preparedness Strategy* covers strategic planning, response and scientific evidence. Contingency plans exist for many emerging infectious diseases. The World Health Organisation collates global influenza preparedness plans [here](#).
- **Coordination** - Government departments, devolved administrations, public health agencies and devolved NHS branches share plans and information.
- **International collaboration** - the UK Government collaborates with others to undertake work on prevention, detection and research. The World Health Organisation has an influenza programme which provides member states with strategic guidance, technical support and coordination of activities.

Response

- **Detection** - specialist epidemiology and microbiology capabilities exist within the UK to identify, characterise and respond to infectious diseases.
- **Antivirals** - the Government stockpiles enough antiviral medicines to help treat people showing symptoms during a flu pandemic. Antivirals can help treat flu symptoms but are not a cure.
- **Vaccines** - vaccines will be developed as soon as possible once new flu strains are identified. This will take at least four to six months after a pandemic begins.
- **Personal protective equipment** - emergency responders have personal protective equipment for severe pandemics and infectious diseases. There are also protocols in place for infection control both before and during an incident.

Metropolitan Cathedral, Mexico City, Mexico, 26 April 2009; during the swine flu epidemic



What you should do...

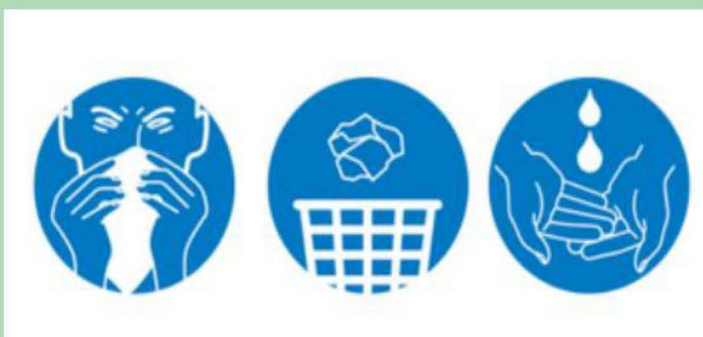
Emerging infectious diseases are closely monitored by public health agencies and international partners such as the World Health Organisation. Information will be provided on specific diseases as and when they emerge. If you are travelling abroad, consult the travel immunization guidance below and make sure your protections are up to date.

You can find a considerable amount of information and guidance online about the [public health response](#) to pandemic flu, including guidance aimed at specific organisations such as schools and higher education institutions, businesses, cleaning staff, and fire and rescue services.

For pandemic flu, good hygiene remains the most effective defence until a vaccine can be developed. Please note that antibiotics will not have any effect on flu, as it is a virus and antibiotics only kill bacteria.

Catch it, Bin it, Kill it

Flu germs can live on some surfaces for hours. If you have flu, you can protect others by carrying tissues with you and using them to catch your coughs and sneezes. Bin the tissue, and to kill the germs, wash your hands with soap and water or use a sanitiser gel. This is the best way to help slow the spread of flu.



Telephone – If you have concerns about symptoms, call the 24/7 NHS non-emergency numbers below. For emergencies continue to dial 999. A non-emergency British Sign Language (BSL) service is available [here](#).



NHS (England and Scotland)
111



NHS (Wales)
0845 4647

Further information online - hyperlinks below

UK pandemic
influenza
strategy

Pandemic
influenza
evidence base

UK pandemic
influenza
guidance

UK infectious
disease
guidance

Foreign travel
immunization
guidance

Public health organisations by nation

England

Scotland

Wales

Northern
Ireland



Animal diseases

What's the risk?

Animal diseases threaten the UK for two main reasons: firstly, because of the potential for some diseases to spread from animals to humans and cause illness or fatalities; and secondly, because they affect the animals on which we rely for food, trade, or to maintain the ecosystem.

Diseases which spread from animals to humans are called 'zoonotic diseases'. Examples include:

- **avian influenza** spread by migratory birds, movements of live poultry, poultry meat or contaminated vehicles / materials. Some strains can cause diseases in humans;
- **West Nile virus** spread by mosquitoes and via birds as intermediate hosts. It can cause encephalitis or meningitis in people (inflammations of the brain / brain lining and spinal cord) although 80% of those infected show no symptoms at all. It has never reached the UK; and
- **rabies** spread by bites / scratches from infected animals. It infects the nervous system and is usually fatal once clinical signs appear. Rabies is present at very low levels in some UK bat populations, but the risk to humans is very low.

Animal diseases which cannot spread to humans are termed 'non-zoonotic'. These harm the UK by affecting animals (particularly livestock) that agriculture or ecosystems rely on. Examples include:

- **foot and mouth** spread by direct and indirect contact and can be wind-borne;
- **swine fever** spread via movement of pigs or contaminated products. Classical swine fever has been recorded in the UK but African swine fever has not; and
- **bluetongue** spread between animals by midges. Severely affects sheep while cattle may show fewer clinical signs. Vaccination has eradicated Bluetongue virus from the UK but livestock remains susceptible to new strains.

Consequences of animal disease may include:

- human **fatalities** and physical / psychological **casualties**;
- **economic damage**, particularly to the livestock industry and via lost trade; and
- **disruption** to tourism and rural communities.

Has this happened before?

Yes. Low and highly pathogenic avian influenza has been recorded in poultry in the UK several times in the last 10 years, most recently in the winter of 2016/17, although with no human cases reported. Bluetongue was first recorded in the UK in 2007, although has since been eradicated from the UK. There was a devastating foot and mouth outbreak in 2001 which cost the UK around £8 billion; however, greatly improved response arrangements ensured that a subsequent 2007 outbreak caused much less damage (£15 million).

What's being done about the risk?

Pre-event

- **Monitoring** of disease outbreaks around the world, with horizon scanning and reporting on

latest trends.

- **Surveillance and alerts** in consultation with veterinary surgeons, industry, animal keepers and operational partners.

Response (using foot and mouth disease as an example)

- **Containment** - strict movement controls, including import controls where disease is detected in other countries, are applied to susceptible animals and animal products.
- **Eradication** - in the UK, susceptible animals on infected premises and in other places where risk of exposure is very high may be culled humanely to reduce the spread of disease.
- **Vaccination** - vaccines are available for some strains of disease and may be used to supplement the culling policy.

What you should do...

The early reporting of any suspicion of animal disease is vital. If you have concerns about the health of your animals, discuss them with your veterinary surgeon. If you suspect a notifiable disease (defined in the guidance links below) you should immediately report it to the Animal and Plant Health Agency. Further guidance specific to animal health monitoring and disease notification is linked below. You can also sign up to the Alerts Service (linked below) to keep up to date with the latest news. For zoonotic diseases (those that can spread to humans), please refer to the Human Diseases section on page 34.

Telephone – Animal and Plant Health Agency (APHA). For APHA in Scotland, contact your local [Field Services Office](#).



APHA (England)
03000 200 301



APHA (Wales)
0300 303 8268

Telephone – If you have concerns about [human symptoms](#), call the 24/7 NHS non-emergency numbers. For emergencies dial 999. A British Sign Language (BSL) service is available [here](#).



NHS (England and Scotland)
111



NHS (Wales)
0845 4647

Further information online - [hyperlinks below](#)

Animal and
Plant Health
Agency

Animal and
plant health
policy

Animal
diseases alerts
service

International
monitoring of
animal disease

Notification
duties of
farmers

Public health organisations by nation

England

Scotland

Wales

Northern
Ireland

MAJOR ACCIDENTS





Widespread electricity failure

What's the risk?

Instances of electricity failure (also referred to as power loss or blackout) can be caused by a number of things, such as severe weather (e.g. very strong winds, lightning and flooding) which damage the distribution network. Damage to the National Electricity Transmission System is much more rare but could cause significant electricity disruption and, in extreme cases, a widespread loss of power. These failures could be local (e.g. a metropolitan area), regional (e.g. the midlands) or national (e.g. across much of the UK).

An electricity failure across entire regions or the UK as a whole has not happened before. Were it to occur, impacts would be very severe, causing widespread disruption to many critical sectors and wider society in general. The National Grid has a recovery process called 'Black Start' to recover the network from a total or partial shutdown. Based on current plans, Black Start recovery could take up to five days with potential for some additional disruption beyond this timescale in the event of significant network damage.

Consequences of a national loss of power may include:

- **fatalities** and physical / psychological **casualties**;
- **disruption or loss** of essential services, particularly transport, food, water, fuel, gas, finance, communications (all types), and education;
- **disruption** to business (via lost working hours); and
- if blackouts are prolonged, also **potential disruption** to health care, emergency services and emerging public disorder.

Has this happened before?

No, a national blackout has never happened. A much less severe incident did occur between 22 and 28 December 2013 when, as a result of two severe winter storms and consequent damage to the distribution overhead line network, around 900,000 UK customers suffered a loss of electricity. 876,000 customers had power restored within 24 hours, however 16,000 experienced disruption for longer than 48 hours. Severe flooding in some areas has also led to instances of local power loss, such as in Lancaster during the 2015-16 floods.

What's being done about the risk?

Pre-event

- **Coordination** - the Department for Business, Energy & Industrial Strategy manages the central Government response to and recovery from electricity disruptions in England, Scotland and Wales. The Northern Ireland Department for the Economy works with Northern Ireland Electricity Networks Ltd to mitigate against and respond to power loss in Northern Ireland.

- **Planning** - the Department for Business, Energy & Industrial Strategy works closely with industry to develop comprehensive plans for handling a complete national outage and in collaboration with the devolved administrations regarding more localised outages.

What you should do...

If you experience a power cut, you can call '105' to report it and get further information. This is a free national service that covers England, Scotland and Wales. 105 is one of the ways you can contact your Distribution Network Operator, who is responsible for maintaining the power lines that bring electricity to your home and business. Both your Distribution Network Operator and the 105 number remain the same no matter who you choose to buy your electricity from.

The 105 website linked below also contains advice on how to prepare for a power cut along with simple steps to take if one occurs. In the (likely) event that you lose access to the Internet along with your power, general preparations such as those highlighted in Chapter 2 are also relevant.

Particularly large-scale electricity failures may prevent landline telephones and mobile phone transmitters from working (which will also affect mobile internet). Regardless of the situation, Government, the National Grid and Distribution Network Operators will be working to restore power as soon as possible.

Fire safety

Matches and candles in the home are useful if you lose electricity, but a torch and batteries would be much safer when handling objects in the dark.



Telephone - Call the free 105 service for more information on specific power cuts



PowerCut105 (England, Scotland and Wales)

105

Further information online - hyperlinks below

What to do in a power cut

Network and contacts advice

National emergency plan - gas & electricity

Responding to energy emergencies



System failures

What's the risk?

System failures is a broad category of risk and includes:

- **utilities failures** (including gas, localised electricity failure, fuel, water and sewerage);
- **financial failures** (such as with banking systems loss or other technical difficulties); and
- **telecommunications failures** (fixed and mobile telephony and broadband).

In many cases these incidents will only affect a specific place or be limited to customers of specific services or private companies. Many incidents will be dealt with locally, although some could have knock-on effects that cause problems for large numbers of people.

Widespread loss of electricity could potentially disrupt all other critical systems to a severe extent, resulting in greater consequences than more typical utilities failures. It is therefore listed separately on the matrix on page 9 and as an individual risk on page 40.

Consequences of system failures may include:

- some **fatalities** and physical / psychological **casualties**;
- **disruption** to essential services, particularly energy, water and/or sewerage, fuel, finance and telecommunications;
- **damage** to property and infrastructure; and
- **economic damage** (particularly to business).

Has this happened before?

Utilities - In April 2007, the failure of a major pumping component at a waste water treatment plant serving 800,000 customers in Edinburgh left thousands without access to clean water and caused 1,000 litres a second of partially diluted untreated sewage to be pumped into the Firth of Forth. A major accident at a gas-processing facility in September 1998 severely disrupted gas supplies to the state of Victoria in Australia. Households lost their gas for heating, cooking and hot water, as did hotels and restaurants, whilst industries that used gas had to close. Gas supplies were restored to major users 10 days later and to householders soon after.

Financial - In June 2012, 6.5 million customers of Royal Bank of Scotland (RBS), including NatWest and Ulster Bank of the RBS Group, were unable to carry out various transactions including cash withdrawals, phone and online banking and debit card payments due to a software update failure.

What's being done about the risk?

Energy

- **Private sector planning** - all network / transmission electricity and gas companies have plans and arrangements in place to deal with supply disruptions.

- **Government planning** - the *National Emergency Plan for Downstream Gas & Electricity* sets out arrangements between government, industry, regulator and other parties for safe and effective management of downstream gas and electricity supply emergencies.
- **Prioritisation** - the *National Emergency Plan for Fuel* sets out the Government's approach to maintaining continuity of fuel supplies in Great Britain. The plan is for use by government, the downstream oil supply industry and resilience planners for local services. It includes the possibility of prioritising fuel for emergency services and rationing fuel to retail customers using legislation under the Energy Act 1976.

Water and sewerage

- **Legislation** - *Security and Emergency Measures (Water and Sewerage Undertakers) Direction 1998* and *Security and Emergency Measures (Scottish Water) Direction 2002* place legal requirements on water companies in Great Britain to manage risks of failure.
- **Response measures** - all water companies can provide alternative water supplies to consumers, as well as command and control centres for more severe emergencies.

Telecommunications

- **Infrastructure investment** - investment, particularly by the large telecoms providers improves resilience to a variety of risks and reduces the likelihood of failure.
- **Coordination** - the Electronic Communications, Resilience and Response Group (EC-RRG) is industry-run, supported by the Department for Culture, Media and Sport and raises awareness of telecommunications resilience and best practice.
- **Planning** - extensive and well-practiced plans are in place for managing emergencies. The *National Emergency Plan for Telecoms* is owned by EC-RRG.
- **Response** - EC-RRG facilitates a response to major incidents through the *National Emergency Alert for Telecommunications* protocol.
- **Engagement** - business customers in particular are encouraged to discuss their needs with their provider to ensure they have adequate levels of resilience in place.

Finance

- **Coordination** - the Financial Authorities (e.g. regulatory bodies such as the Financial Conduct Authority) play a role in supervising, coordinating and driving change to improve the operational resilience of the finance sector.
- **Engagement** - the Financial Authorities test the sector's resilience to IT failures, and are working with the sector to review technology resilience arrangements at major retail firms.
- **Response** - the Financial Authorities coordinate their response to major operational disruption affecting the finance sector through the Authorities' Response Framework.

All sectors - response

- **Specialist training** for ambulance and fire service personnel (particularly for operating in high-risk environments).
- Promoting the **Joint Emergency Services Interoperability Principles** - improving the way our emergency services work together.

Further information online - hyperlinks below

Bank of England -
financial sector
continuity

Telecoms
resilience
guidance

National
emergency plan -
gas & electricity

Responding to
energy
emergencies



Major transport accidents

What's the risk?

Transport accidents occur across the UK on a daily basis, mainly on roads, and involving private vehicles. Well-practised plans exist to deal with these locally. This section focuses on rare but severe accidents that would require some form of national response.

Consequences of a major transport accident may include:

- **fatalities** and physical / psychological **casualties**;
- **disruption** to essential services, particularly transport;
- **disruption** to business and tourism;
- **damage** to property and infrastructure;
- possible **environmental contamination** (such as with fuels / cargoes); and
- possible **evacuation and shelter** of local residents or employees.

Has this happened before?

Thanks to modern safety regimes, large-scale transport accidents are very rare.

Air - There have been no major air accidents in the UK since the Kegworth incident in 1989, when a Boeing 737 crashed close to the M1 motorway, resulting in 47 fatalities. A helicopter crashed in Vauxhall, London on 13th January 2013, resulting in the deaths of the pilot and a passer-by struck by falling debris. A helicopter lost power and crashed in Glasgow on 29 November 2013, resulting in 10 fatalities. On 22 August 2015, a Hawker Hunter crashed onto the A27 road while participating in an aerial display, resulting in 11 fatalities among people on the ground.

Maritime - The *Herald of Free Enterprise* was the last major accident on a UK-flagged ship at sea; it capsized in March 1987 shortly after leaving Zeebrugge en route to Dover, resulting in 193 fatalities. On river routes, the collision between the *Marchioness* and the *Bowbelle* in August 1989 on the Thames resulted in 51 fatalities. The *Estonia* sank in the Baltic Sea in 1994, resulting in 852 fatalities, while the *Costa Concordia* capsized off the Italian coast in January 2012, resulting in 32 fatalities. Marine accidents such as the *MSC Napoli* in January 2007 and (to a much lesser extent) the *Hoegh Osaka* in January 2015 disrupted shipping in and around UK waters although neither involved major casualties thanks to the diligence of those responding.

Road - Even the largest road incidents would be highly unlikely to warrant a coordinated UK government or devolved administration response and would instead be managed by local authorities and the emergency services.

Rail - The Potters Bar derailment in May 2002 resulted in seven fatalities and over 70 injuries. The Grayrigg incident in February 2007 resulted in one fatality and 88 injuries. The first (and only) incident involving fatalities on a modern light railway occurred in Croydon, England in 2016, where

a tram derailed causing seven fatalities and 51 casualties.

What's being done about the risk?

Pre-event

- **Infrastructure improvements** - upgrades over recent years, alongside safety regimes, have led to substantial reductions in both the frequency and impacts of rail accidents. 2015/16 was the ninth consecutive year without any fatalities as a result of accidents on the mainline railway caused by trains or railway infrastructure.
- **Safety regimes and regulation** - there are different regimes for individual transport sectors.

Response

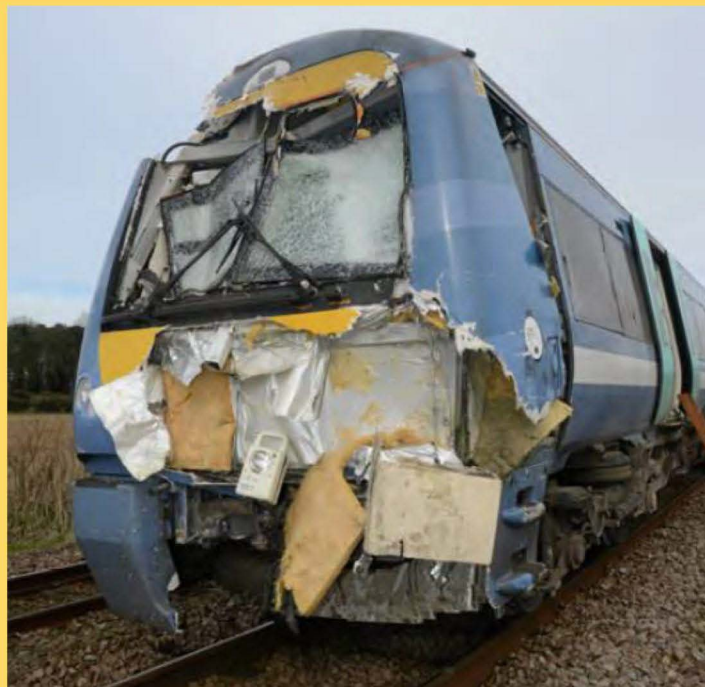
- **Planning** - all transport sector operators have plans that cover a range of possible incidents, including those most likely to create wider impacts. These plans include the diversion of routes where possible, based on safety and operational requirements.
- **Emergency services** - the response by emergency responders to transport accidents is covered by their existing arrangements for responding to other types of major incidents.

Train 1K77

10 April 2016

Damage to the cab of passenger train '1K77' after a collision with a moving tractor at Hockham Road crossing on a line between Harling Road and Thetford, England. The train was moving at 87mph and the resulting collision led to six people being injured, including the tractor driver and train driver. Fortunately there were no fatalities.

Note: taking the train is still statistically 22 times safer than travelling by car and over 1,200 times safer than travelling by motorcycle.



Further information online - hyperlinks below

Civil Aviation
Authority

Rail Accident
Investigation
Branch

Marine Accident
Investigation
Branch

Air Accident
Investigation
Branch

Transport organisations by nation

United
Kingdom

Scotland

Wales

Northern
Ireland



Industrial and urban accidents

What's the risk?

Industrial and urban accidents can take a wide variety of forms and their impacts vary considerably in both scale and nature. In some cases these accidents will have very limited impacts beyond the immediate area and can be dealt with locally, although others can have cascading effects that will have a wider impact. This is a broad category of risk and includes:

- **fires and explosions** (affecting, e.g. residential buildings, power plants, refineries or oil rigs);
- **chemical and biological contamination** (such as oil spills or food contamination);
- **radiological contamination** (from nuclear accidents in the UK or abroad); and
- **dam breach** (leading to a sudden emptying of reservoirs and subsequent flooding).

Consequences may include:

- **fatalities** and physical / psychological **casualties**;
- **disruption** to essential services, particularly energy and transport;
- **damage** to property and infrastructure;
- **economic damage**;
- **environmental contamination** (such as with oil or radiation); and
- **evacuation and shelter** of affected individuals.

Has this happened before?

Fires - In December 2005 Europe's largest peacetime fire occurred at the Buncefield Oil Storage Terminal in Hemel Hempstead, England, resulting in a number of injuries. The surrounding area was temporarily evacuated and some local businesses experienced long-term disruption to operations. In October 2016 an explosion occurred at the BASF chemical company's Ludwigshafen HQ, Germany, resulting in three fatalities and 30 casualties. On 14 June 2017 a residential fire in Grenfell tower block in London, UK, spread beyond the originating apartment, resulting in at least 80 fatalities (investigation ongoing as of September 2017) and at least 70 injuries.

Chemical contamination - In 1976 an accident occurred at a chemical plant near Seveso, Italy, contaminating an area of more than 25km². More than 600 people had to be evacuated and up to 2,000 people were treated for dioxin poisoning. In 1996 the crude oil tanker *Sea Empress* grounded off south-west Wales, spilling approximately 72,000 tonnes of oil into the sea, damaging local environments and wildlife. In 2005 over 650 products were taken off the shelves in UK supermarkets due to concerns about contamination of food products with Sudan 1, a colouring agent banned in many countries, although it is still used in some parts of the global food industry. On 20 April 2010 an accident occurred at the *Deepwater Horizon* oil rig in the Gulf of Mexico, resulting in 11 immediate fatalities and almost five millions barrels of spilt oil.

Radiological contamination - Nuclear sites are designed, built and operated so that the chance of accidental releases of radiological material in the UK is extremely low. Historical accidents include Windscale (UK) in 1957, Three Mile Island (US) in 1979, Chernobyl (Ukraine) in 1986 and Fukushima (Japan) in 2011. Of these, Chernobyl and Fukushima were the most severe.

Dam breach and inundation - Dam breaches in the UK are rare; the last major breach was at the Cwm Eigiau dam in 1925, which caused 17 fatalities and widespread flooding. The Malpasset dam in southern France was breached on 2 December 1959. This created a wall of floodwater 40 metres high, moving at 70 kilometres per hour. It destroyed two small villages and, in 20 minutes, reached Fréjus, seven kilometres to the south, where it was still three metres high. The flood resulted in over 400 fatalities and widespread damage.

Buncefield oil storage terminal, Hemel Hempstead, England, 11 December 2005⁸



What's being done about the risk?

All sectors

- **Exercising** - emergency responders and infrastructure authorities practice response plans and using capabilities for simulated emergency scenarios.
- **Legislation** - *Control of Major Accident Hazard Regulations 2015* and *Control of Major Accident Hazard Regulations (Northern Ireland) 2000* are the laws under which major hazard sites are regulated and inspected to prevent and mitigate accidents involving dangerous substances. Some sectors / infrastructure types have specific regulations (e.g. pipelines).
- **Specialist training and equipment** - is provided to emergency responders, including those operating in high-risk and contaminated environments. Equipment requirements are reviewed in light of major incidents and adjusted where necessary.
- The UK Government promotes the **Joint Emergency Services Interoperability Principles**, which improve the way our emergency services work together.
- **Decontamination** - emergency responders and some industrial facilities are trained and equipped to decontaminate those affected by incidents. The Government Decontamination Service coordinates clean-up operations and elements of environmental recovery.

⁸ Photography courtesy of Creative Commons; Robert Stainforth

- **Oversight** - the Health and Safety Executive (in England, Scotland and Wales) and Health and Safety Executive Northern Ireland work with public health agencies, industry and local authorities to reduce the risk from industrial accidents. The Maritime and Coastguard Agency has plans that include emergency responders and local authorities, with procedures for handling vessels involved in accidents and blowouts from offshore wells. The Department for Communities and Local Government (in England) and the Devolved Administrations (in Scotland, Wales and Northern Ireland) have oversight over local authorities' residential fire safety regulations.
- **Testing** - a vigorous testing regime is being conducted on relevant tower blocks around the UK as a result of the Grenfell fire. This includes specific testing on elements of the building materials, design and outer cladding. As of September 2017 this investigation is still ongoing.

National Firefighters' Memorial

Located on Carter Lane Gardens on the approach to St. Paul's Cathedral, the memorial commemorates those firefighters who lost their lives during the Second World War. It was rededicated in 2003 by HRH the Princess Royal to also honour all firefighters who have lost their lives in the line of duty.

1,192 names are inscribed into the pedestal.



Nuclear sites

- **Legislation and regulation** - Nuclear sites are covered by the *Radiation (Emergency Preparedness and Public Information) Regulations 2001*. The industry also has its own regulator in the Office for Nuclear Regulation.
- **Planning** - the UK Government maintains, updates and tests response plans for nuclear accidents, including those caused by nuclear accidents overseas.
- **Monitoring** - the UK Government regularly monitors radiation levels, including by ground sampling. A national radiation monitoring network and emergency response system analyses background radiation levels 24 hours a day, alerting government if abnormal levels are detected.
- **Identifying lessons** - following Japan's Fukushima nuclear incident in 2011, the UK Government assessed the upgraded safety and emergency response arrangements for nuclear sites in the UK and confirmed that they were satisfactory. Government regularly reviews lessons learned and aims for continuous improvement in our arrangements, including adopting international regulations arising out of new evidence.

Dam breaches

- **Regulation** - English, Scottish and Welsh reservoirs are regulated under the *Reservoirs Act 1975*, with additional regulation from the *Reservoirs (Scotland) Act 2011*.
- **Mapping** - organisations such as the Environment Agency (linked below) and [Natural Resources Wales](#) conduct extensive mapping of risk areas to support planners, reservoir personnel and responders in contingency planning and mitigation.

- **Public information** - the Environment Agency's 'What's in your backyard?' website enables users to view whether an address in England and Wales is in an indicated flood zone for a reservoir. A Scottish equivalent is also [available here](#).

What you should do...

Know your building

- Familiarise yourself with the safety codes and emergency escape routes for the buildings in which you live or work. These could include fire escapes, emergency refuge areas or designated evacuation areas. Always follow instructions from the emergency services. The Fire and Rescue Services have helpful guidance on [fire safety in the home](#), [escaping from fires](#) (also linked below), as well as specifically for [shared or rented accommodation](#).

Know your area

- Check your local council's website for details of major industrial sites in your area. The Health and Safety Executive's '[Control of Major Accident Hazard \(COMAH\) website](#)' also has information on nearby major industrial facilities.
- The Environment Agency's '[What's in your backyard? website](#)' shows flood zones for reservoirs in England and Wales, and also provides a similar service for landfills and historic mine waste facilities. If you live in Scotland, you can find similar information on the '[What's in my area? website](#)'.

Industrial accidents

- As with the guidance above, know what major industrial sites are in your local area. Make sure you are familiar with any advice they and your local authority provide.
- If you become aware of an incident at a local major industrial facility (e.g. a nuclear power plant, oil processing depot or chemical plant), **go indoors, stay indoors and tune in**. Close doors and windows to protect yourself from potential fumes or contaminants, and be prepared to evacuate if instructed to do so by emergency responders.
- If you suspect that the building you are in is at immediate risk of fire from a neighbouring facility, evacuate in the opposite direction of the incident.
- Follow the advice of the emergency services; responders have emergency plans in place for incidents in your area, and are trained and equipped to deal with industrial accidents.

Dam breaches

- Be aware of dams and reservoirs in your area, and familiarise yourself with any emergency advice issued by the facility managers and your local authority.
- A UK dam breach is highly unlikely. However, if a breach occurs you will be warned by the emergency services and may be asked to evacuate; always follow their instructions.

Further information online - hyperlinks below

Fire Escape Guidance	What's in your backyard?	Radioactive Incident Monitoring Network	Marine Pollution Contingency Plan
Control of Major Accident Hazards (COMAH)	Offshore oil and gas – Health & Safety Executive	Nuclear emergency planning guidance	Government Decontamination Service

SOCIETAL RISKS





Industrial action

What's the risk?

Industrial action (or a 'strike') is where a group of workers do not attend work as a means of protest. A trade union can only call for a strike if a majority of its members involved support it in an organised vote called a 'ballot'. There are legal restrictions around how long such strikes can last and in certain critical sectors (such as policing and for prison officers) striking is unlawful. Industrial action can lead to temporary closures, reduced services and disruption to organisations, customers and the general public. Services generally continue but at a reduced capacity.

Consequences of industrial action may include:

- **disruption** to essential services, particularly transport, health and education;
- **disruption** to business (via lost working hours);
- possible **public order** challenges (with associated pressure on policing); and
- **economic damage** (particularly for transport sector industrial action).

Has this happened before?

Yes, across a variety of sectors. In the twenty-first century, there have been strikes in both the public and private sector by; fuel tanker drivers, firefighters, teachers, health service staff, London Underground workers, government employees, and other groups of workers. The majority of recent industrial action and associated activity at picket lines has been peaceful.

What's being done about the risk?

Pre-event

- **Negotiation** - wherever possible the Government encourages negotiation and mediation, such as via the Advisory, Conciliation and Arbitration Service (ACAS), as a means of resolving industrial action both before and during a strike.
- **Monitoring** - the UK Government and devolved administrations work together closely to monitor impending strike action and resolve it where possible.
- **Legislation** - the *Trade Union Act 2016* provides additional protections to critical services.
- **Contingency planning** - the Civil Contingencies Act legally obliges some organisations such as the emergency services to plan for how to maintain services in the event of a strike. Other critical sectors such as fuel distribution also have comprehensive plans in place.

Response

- **Substitutions** - this involves staff from within or outside an organisation working adjusted rotas in order to cover for those on strike, e.g. medical consultants standing in for junior doctors, or the armed forces assisting with mitigating fuel supply distribution.

Further information online - hyperlinks below

What does the law say?

Taking part in industrial action

Citizens' rights

If your business faces industrial action



Widespread public disorder

What's the risk?

Public disorder can take many forms, including rioting, looting, vandalism, violence and arson. Disorder is unpredictable and peaceful protests can escalate quickly when small numbers of individuals are intent on provoking violence. Disorder can be influenced by a variety of factors, such as a breakdown in community and police relations, or other community tensions. Public disorder may be caused by long-standing grievances or as a spontaneous response to a single incident. Peaceful protests are not considered a form of public disorder.

Consequences of public disorder may include:

- physical / psychological **casualties**;
- **disruption** to critical services, particularly policing and health;
- **damage** to property and infrastructure;
- possible evacuation or **temporary shelter** requirements; and
- possible **economic damage**.

Has this happened before?

In recent decades serious disorder in the UK has been rare. On 6 August 2011 a protest in Tottenham escalated into widespread violent disorder. Over four days, disorder spread first in London and then to Manchester, Salford, the West Midlands and a number of other towns and cities across England. The disorder varied in character from area to area but included violence directed at police officers, damage to property and extensive looting. The G20 summits in 2009 and 2017 resulted in varying degrees of violent disorder, while the tuition fees protest in 2010 also involved some cases of criminal damage and use of improvised missiles against police.

What's being done about the risk?

Pre-event

- **Monitoring** - the police have a range of mechanisms in place that identify and assess known and emerging risks that could require a public order policing response.
- **Understanding triggers** - significant work has been carried out post-2011 to improve the Government's understanding of how public disorder can begin. This allows the police to identify risks and prepare in advance with plans to allocate and mobilise resources.

Response

- **Capabilities** - improvements have been made post-2011 in terms of mobilisation, tactics and training for police, ensuring they have the necessary capabilities to respond.
- **Coordination** - the National Police Coordination Centre supports forces in England and Wales and liaises with Police Scotland and Police Service Northern Ireland to ensure that mutual assistance is provided when required.

MALICIOUS ATTACKS

7 JULY 2005
09:47
TAVISTOCK SQUARE



Malicious attacks: introduction

What's the threat to the UK?

The UK faces a serious and sustained threat from terrorism, including from international groups, domestic extremists and Northern Ireland-related groups. As of September 2017, the current UK threat level for international terrorism is 'severe'. This means an attack is highly likely. The level of threat in Northern Ireland from Northern Ireland-Related Terrorism (NIRT) is also 'severe', although in Great Britain (England, Wales and Scotland) the threat level from NIRT is lower.

The Joint Terrorism Analysis Centre explains all the threat levels and provides updates on the current assessments [here](#).

Who are these potential attackers?

For the purposes of this document, 'terrorist' refers to any individual or group seeking to use violence as a means of inflicting terror for political reasons. This includes a wide variety of individuals and groups of varying ideologies and backgrounds.

Islamist extremists continue to pose the most significant terrorist threat to the UK and to UK interests and nationals abroad. Such groups include Daesh (also known as the so-called 'Islamic State', ISIL, and ISIS) in Iraq and Syria, Al Qa'ida (centred in Afghanistan and Pakistan), Al Shabaab (in Somalia), and Boko Haram (in Nigeria). Al Qa'ida and Daesh-affiliated groups can be found in the Middle East, South Asia, and North and West Africa, although Daesh has also expanded into South-East Asia and East Africa. These groups thrive in unstable environments where conflict and long-term societal problems have led to breakdowns in governance and law and order, providing a vacuum in which violent groups can base themselves, recruit, extort funding, and train. Numerous Islamist extremist groups want to conduct terrorist attacks against the western world, including the UK. The return of experienced fighters to the UK and Europe from Syria increases this threat. Online radicalisation of impressionable individuals is a serious problem and allows Islamist extremist groups to recruit from inside western and other countries. Individuals may become radicalised by international groups but choose to conduct attacks independently without external contact.

Northern Ireland-Related Terrorism is still a notable threat, with violent dissident republican groups intent on perpetrating attacks against (e.g.) the Police Service of Northern Ireland and prison officers.

Violent far-right extremism is relatively infrequent in the UK but does happen. Such individuals and groups generally seek to target specific individuals, minorities and politically-affiliated groups rather than the wider public.

What weapons and technologies could be employed?

Many of the networks and individuals who pose a terrorist threat seek to harm large numbers of people. Bladed weapons are cheap and easy to acquire. Firearms have strict regulations around ownership and sale but it is possible to acquire weapons illegally. Unsophisticated explosive devices can be made with household items. Vehicles can be used to drive into crowds. Some groups aspire to use non-conventional weapons such as chemical, biological or radiological substances, such as those employed by Daesh in Syria. Others aspire to attack infrastructure using both traditional methods and alternatives such as cyber attacks. In addition to being a mode of attack, cyber is commonly used as a means of recruitment, fund-raising and radicalisation, targeting isolated individuals online. Overall, any form of attack can potentially threaten life, property and community cohesion.

What's our strategy to respond?

The UK Government's counter-terrorism strategy, CONTEST (2011), is an integrated approach to counter-terrorism, based on four main elements. Each has a clear objective to reduce the risk to the UK from terrorism.

- **Prevent** (stopping people becoming terrorists or supporting terrorism in the first place)
- **Protect** (strengthening our defences against a terrorist attack)
- **Pursue** (stopping terrorist attacks, up to and including at the scene of attack)
- **Prepare** (where an attack cannot be stopped, mitigating its impacts)

Under CONTEST, comprehensive plans have been developed to protect: sites critical to national infrastructure; transport networks including planes and international rail; crowded places such as sports venues and shopping centres; and the UK's borders. Thousands of emergency responders, workers and key officials have been trained and equipped to deal with a terrorist incident, including those involving chemical, biological and radiological weapons. This ensures that our response to an attack is as effective, coordinated and immediate as possible.

The Government raises awareness among the responder community, local authorities and other organisations regarding the threat from terrorist groups in order to help them identify potential risks. For example, training is being given to NHS staff which helps them to identify individuals accessing healthcare services who might be vulnerable to radicalisation and refer them to appropriate organisations for support and protection. The National Domestic Extremism and Disorder Intelligence Unit continues to take the lead in setting the strategic national direction for domestic extremism intelligence and supports UK police forces in tackling these threats.

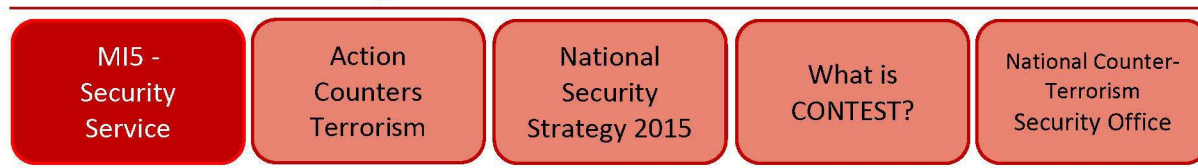
Telephone - Anti-Terrorist Hotline: "It's probably nothing, but..."



(United Kingdom)

0800 789 321

Further information online - hyperlinks below





Attacks on crowded places

What's the risk?

Crowded public places unfortunately remain an attractive target for terrorists, because they are generally easily accessible, tend to have less security and can be used to cause large scale injury and loss of life. Potential targets include pedestrian routes and other thoroughfares as well as sports arenas, retail outlets and entertainment spaces. Attacks could be carried out using a variety of weapons including blades, firearms, explosives, and vehicles deliberately used to harm people.

Consequences of an attack on a crowded place may include:

- **fatalities** and physical / psychological **casualties**;
- **damage** to property and infrastructure;
- **disruption** to essential services, particularly transport, health and education;
- **economic damage**, particularly via disruption to tourism; and
- **evacuation and shelter** of local residents or employees.

Has this happened before?

On 22 July 2011, a lone terrorist conducted a bomb attack in Oslo, Norway, resulting in eight fatalities and over 200 casualties. This was followed by an attack on an isolated youth camp, where the same terrorist killed 69 people and injured over 30 others. On 26 June 2015, a lone terrorist attacked a beach resort in Sousse, Tunisia, killing 38 people. On 13 November 2015 multiple groups of terrorists attacked restaurants, cafés, a sports stadium and a concert theatre in Paris, France, killing 130 and injuring several hundred. On 19 December 2016, a lone terrorist used a vehicle to attack a market in Berlin, Germany, killing 12 and injuring over 50. On 22 March 2017 a lone terrorist used a vehicle and knife to conduct an attack in London, UK, killing five and injuring over 50. On 22 May 2017, a lone terrorist detonated a suicide explosive device outside a concert venue in Manchester, UK, killing 22 and injuring over 100. On 3 June 2017, three terrorists used a vehicle and knives to kill eight people and injure 48 others in a marauding attack in London, UK. On 19 June 2017, a lone terrorist drove a van into pedestrians outside a mosque in London, UK, killing one and injuring ten.

What's being done about the risk?

Reducing vulnerability

- **Awareness-raising** - the Government provides a range of advice through Counter Terrorism Security Advisers, training and guidance documents to help businesses and other organisations understand the terrorist threat, improve protective security and preparedness, spot signs of suspicious activity and take other appropriate actions.
- **Physical protective security** - this includes barriers to prevent vehicles being used as a weapon, or to keep vehicle bombs further from buildings to mitigate the effects of the blast.

Limiting adversary capability

- **Explosive material limitations** - measures are in place to make it more difficult to source

ingredients needed to manufacture homemade bombs.

- **Stringent border security** - this makes it more difficult to smuggle weapons or dangerous substances into the UK.

Improving response

- **Major incident plans** - are regularly tested in exercises, where emergency responders practice using plans and response capabilities.
- **Armed response** - Government is now investing in additional armed policing capability.
- **Specialist training** - such as ambulance and fire service personnel operating in high-risk environments.
- The **Joint Emergency Services Interoperability Principles** have improved the way the UK's emergency services work together.

What you should do...

The Police Service and partners work very hard to keep us safe from threats. To support the public to protect themselves further, the National Police Chiefs' Council has produced a helpful YouTube video about how best to respond during a marauding terrorist attack, which can be [found here](#).

IN THE RARE EVENT OF a firearms or weapons attack

RUN HIDE TELL



RUN to a place of safety. This is a far better option than to surrender or negotiate. If there's nowhere to go, then...

HIDE It's better to hide than to confront. Remember to turn your phone to silent and turn off vibrate. Barricade yourself in if you can. Then finally and only when it is safe to do so...

TELL the police by calling 999.

RUN

- IF THERE IS A SAFE ROUTE, RUN
- INSIST OTHERS GO WITH YOU
- DON'T LET THEM SLOW YOU DOWN
- LEAVE YOUR BELONGINGS BEHIND

Consider your route as you leave, will it place you in the line of fire?

HIDE

- IF YOU CAN'T RUN, HIDE
- FIND COVER FROM GUNFIRE
- LOCK THE DOOR AND BARRICADE YOURSELF IN
- MOVE AWAY FROM THE DOOR
- BE VERY QUIET, SILENCE YOUR PHONE

Don't shout for help or do anything that will give away your hiding place.

TELL

- DIAL 999 ONLY WHEN YOU ARE SAFE
- GIVE YOUR LOCATION
- GIVE THE DIRECTION THE ATTACKER IS MOVING IN
- GIVE AS MUCH INFORMATION AS YOU CAN
- CAN YOU SAFELY STOP OTHERS FROM ENTERING THE AREA?

Call the police, dial 999 and tell them clearly, the location of you and the attackers...

Further information online - hyperlinks below

National Counter-Terrorism Security Office

Protecting Crowded Places – Guidance

Physical Security Advice

Protecting Against Terrorism



Attacks on transport systems

What's the risk?

Transport systems include (but are not limited to) railways, buses, passenger ferries, cargo vessels and aircraft. Attacks against such systems could take a variety of forms, including explosives and attackers wielding blades or firearms. In the UK, conventional terrorist attacks on land and air-based transport are more likely than against maritime (water) transport, although risks to maritime transport do exist, and are higher overseas. The likelihood of any of these things happening to any particular individual is still very low.

Consequences of an attack on a transport system may include:

- **fatalities** and physical / psychological **casualties**;
- **damage** to property and infrastructure;
- **disruption** to essential services, particularly transport;
- **disruption** to tourism;
- **disruption or interruption** of imports (particularly in the case of maritime incidents); and
- possible **evacuation and shelter** of local residents or employees.

Has this happened before?

Railways and subways - These forms of transport rely on the quick and easy movement of people on and off trains and as a result tend to have fewer physical security measures (such as metal detectors). On 7 July 2005, London's transport system was attacked with four explosions (three on underground trains, one on a bus), resulting in 52 fatalities and over 750 casualties. Subsequent attacks were attempted (unsuccessfully) two weeks later. There was a failed gun attack on a high speed train to Paris in August 2015. On 22 March 2016, three coordinated suicide bombings occurred in Belgium: two at Brussels Airport in Zaventem; and one at Maalbeek metro station in central Brussels, resulting in 32 fatalities and over 300 casualties.

Air - Over the past 30 years there have been a number of attacks by terrorists against aircraft. These include: the 1988 bombing of a Pan Am flight over Lockerbie, Scotland, resulting in 270 fatalities; and the crashing of hijacked planes into the World Trade Center, the Pentagon and Pennsylvania, United States, in September 2001, resulting in 2,977 fatalities and over 6,000 casualties. Unsuccessful attacks include: a liquid bomb plot in 2006, attempting to circumvent security; a failed detonation in December 2009 on a flight from Amsterdam to Detroit; and explosives concealed in printer cartridges on cargo planes in October 2010. Attacks on airport infrastructure also occur, such as at Brussels Airport in March 2016, Istanbul Airport in June 2016 and Glasgow Airport in June 2007.

Maritime - To date, terrorists have not mounted an attack against ships or boats in the UK. However, attacks like those seen overseas (e.g. the suicide bomb attack on the *USS Cole* in Aden in 2000, the attack on the oil tanker *M. Star* in 2010 and recent attacks on shipping near Yemen and in the Bab-al-Mandeb Strait) cannot be ruled out in the UK.



What's being done about the risk?

A number of the mitigation measures described on pages 56 and 57 are also relevant to transport attacks as they: reduce the vulnerability of potential targets; limit the ability of attackers to make explosives or get hold of weaponry or other dangerous substances; and ensure responders are able to operate effectively. In addition, the activities below further reduce the risk to transport.

Railways and subways

- **Regulation and monitoring** - National Railways, London Underground, Docklands Light Railway and Glasgow Subway are all regulated and monitored by Department for Transport (DfT) who require these organisations to deliver a range of security measures. DfT also provide a range of best practice advice to the trams and bus and coach sector.
- **Channel Tunnel** - the Eurostar is subject to very stringent security screening requirements, similar to airport-style regimes. The tourist shuttle and freight are also subject to spot searches.
- **British Transport Police** - provide dedicated, specialised and tailored policing of the railway network. They work with industry and DfT on security.

Air

- **Screening** - of passengers, luggage and all staff working in restricted airport areas.
- **Separation** - physical barriers in airports are placed between incoming international passengers and all outbound travellers.
- **Vetting** - vetting involves undertaking background checks on staff in sensitive posts.
- **In-flight security and inspections** - in-flight security includes hardened and lockable cockpit doors. Regular inspections by the Civil Aviation Authority ensure compliance with security measures.
- **Overseas advice** - the Government gives guidance to UK airlines operating abroad regarding security measures.
- **Cargo** - the UK's cargo regime sets out security screening standards for all in-bound and out-bound cargo.

Maritime

- **Standards** - the Government sets security standards for UK ports and UK-flagged ships.
- **Inspections** - compliance is monitored / measured through inspections and reviews undertaken by Department for Transport and the Maritime & Coastguard Agency.
- **Sea marshals** - the UK and France have negotiated an agreement that allows armed French sea marshals to be deployed on French-flagged cross-Channel ferries travelling between France and the UK.
- **Engagement** - the Government works with other countries on improving port security measures.

What you should do...

The Police Service, the British Transport Police and many partners in the UK and abroad work very hard to keep us safe from threats. Attacks on transport are infrequent but the simple 'Run Hide Tell' guidance on page 57 is useful and relevant for many transport locations such as ships or airports, the video guidance for which can be [found here](#).

To help prevent attacks from occurring, the public can also play an important role by reporting suspicious behaviour or unattended items to a member of staff or the police. You can contact the British Transport Police by texting 61016, or you can call the police non-emergency number on 101. [If you see it, say it. It will be sorted.](#)



Telephone - To report a crime or incident, call the numbers below. For emergencies dial 999.



(British Transport Police - United Kingdom)

0800 40 50 40, or text 61016



(Police non-emergency number - United Kingdom)

101

Further information online - [hyperlinks below](#)

British Transport
Police

National Counter-
Terrorism
Security Office

Transport security
newsfeed

National Strategy
for Maritime
Security



Attacks on infrastructure

What's the risk?

Critical national infrastructure is the buildings and other systems and networks needed to keep the UK running and provide the essential services that we rely on. These services could be essential to basic human needs, such as electricity for cooking or water for drinking, or they could be essential to keeping other infrastructure and the UK economy running, such as telecommunications. Deliberate attacks on infrastructure would cause many of the same problems as an industrial accident, technical failure or severe weather affecting services.

Attacks on infrastructure could be carried out by using explosives or other physical weapons, or by cyber means. Further information about the cyber risk can be found on page 63.

Consequences of an attack on critical infrastructure may include:

- **fatalities** and physical / psychological **casualties**;
- **damage** to property and infrastructure;
- **disruption** to essential services, particularly energy, transport and telecommunications;
- **economic damage** (particularly to business); and
- possible **evacuation and shelter** of local residents or employees.

Has this happened before?

Terrorists in the UK have previously attacked, or planned to attack, national infrastructure. Attempts were made to attack electricity substations in the 1990s. Bishopsgate, in the City of London, was attacked in 1993 and South Quay in London's Docklands in 1996. These attacks resulted in significant damage and disruption but relatively few casualties. Outside the UK, terrorists have carried out attacks against energy infrastructure (in Algeria and Yemen in 2007, 2008 and 2013) and against financial institutions and government buildings. The worst of these was against the World Trade Center, the Pentagon and Pennsylvania, United States, in 2001, resulting in 2,977 fatalities and over 6,000 casualties.

What's being done about the risk?

A number of the mitigation measures described on pages 56 and 57 are also relevant to infrastructure attacks as they: reduce the vulnerability of potential targets; limit the ability of attackers to make explosives or get hold of weaponry or other dangerous substances; and ensure responders are able to operate effectively. In addition, the activities below further reduce the risk to infrastructure.

Reducing vulnerability

- **Specialist advice** - the Centre for the Protection of National Infrastructure is the Government authority that provides protective security advice to businesses and organisations across the UK national infrastructure. They also provide integrated advice on physical and personnel

security, aimed at minimising risk and reducing our vulnerability to terrorism, espionage and other national security threats.

- More broadly, the UK has a comprehensive and well-established programme of work to protect our national infrastructure from terrorism and other security threats.

Common capabilities and responses

- The consequences of attacks on infrastructure and the plans to deal with them are frequently the same as they would be if an industrial accident happened at a critical national infrastructure site (see page 46). Developing plans that can be used in a range of situations is an efficient and effective means of ensuring we have the capabilities in place to deal with a variety of emergencies.

Physical protective security

Barriers such as these retractable bollards protect a variety of urban or industrial infrastructure sites from attacks employing vehicles. Use of architecture offers protection 24 hours a day, and can be cheaper and more sustainable than more active security measures, such as additional security personnel.



What you should do...

The Police Services and many partners in the UK and abroad work very hard to keep us safe from threats. Attacks on infrastructure are infrequent but the simple 'Run Hide Tell' guidance on page 57 is still useful and relevant if you find yourself caught in an incident. The National Police Chiefs' Council has a video explaining 'Run Hide Tell' which can be [found here](#).

Similarly, the British Transport Police's 'See it, Say it, Sorted' guidance on page 60 is also relevant. There is no distinction between the need to alert security to the presence of suspicious activity, regardless of whether this is occurring in locations such as airports, train stations, utilities buildings or major offices. More information can be [found here](#).

Further information online - hyperlinks below

[CPNI](#)

[National Counter-Terrorism Security Office](#)

[Terrorist threat guidance](#)

[Bomb threat Police checklist](#)



Cyber attacks

What's the risk?

Cyberspace is essential to our economy and society. While cyberspace supports open markets, sharing of information and access to knowledge, this very openness makes us more vulnerable to criminals, terrorists and foreign intelligence services seeking to steal our data, compromise our services or radicalise members of the public. Cyberspace is both a direct means of damaging our systems or extorting money, as well as a means through which hostile groups can recruit, fund-raise, inspire and manipulate.

One eighth of our Gross Domestic Product comes from the digital economy. UK digital industries grew two and a half times more quickly than the economy as a whole between 2003 and 2013 and we rely on cyber security to keep our digital economy safe. The UK also has the highest percentage of individual internet usage of any G7 economy.

The scale of our dependence on cyberspace means that our prosperity, key infrastructure, places of work and our homes can all be affected by cyber attacks. Vulnerabilities can take time to identify and exploited systems can be used to attack other systems and networks, making culprits difficult to identify.

Consequences of a cyber attack may include:

- possible **fatalities** and physical **casualties** (in the event of loss of critical services);
- **loss of availability**, by denying legitimate access to systems and information services;
- **loss of confidentiality**, through information being stolen or released;
- **loss of integrity**, where data is damaged or corrupted;
- possible **disruption** to critical services, such as energy or health;
- **economic damage**, particularly to business; and
- **reputational losses**.

Has this happened before?

Cyber attacks occur almost constantly. Accurate estimates are difficult to determine but economic losses as a result of cyber attacks are judged to be in the tens of billions of pounds. A cyber attack on one of the UK's major Internet Service Providers cost £60 million and the loss of 95,000 customers. 46% of all UK businesses (rising to 66% and 68% of medium and large firms respectively) identified at least one cyber security breach or attack in the last 12 months. Some firms are attacked much more than others; 13% of businesses are attacked daily. On average, there are 1,000 cyber security breaches a year for every UK business, distributed unevenly. The average business faces costs of £1,600 a year due to these breaches, falling only slightly to £1,400 a year even for micro and small businesses. Attacks can have global implications. On 12 May 2017, the WannaCry ransomware attack affected over 200,000 computers in 150 countries, including systems within 47 NHS Trusts, leading to significant disruption to patients.

What's being done about the risk?

Government

- **Strategy** - the *2015 National Security Strategy* described cyber as a 'top tier' threat, making it a Government priority to address the risk. As part of the 2015 Strategic Defence and Security Review, the Government committed to developing a comprehensive strategy to tackle the cyber risk whilst ensuring that we remain at the forefront of the digital world. In fulfilment of this commitment, the Government published the National Cyber Security Strategy 2016-2021 which is available in the links below. A local version for Scotland can also be [found here](#).
- **Coordinated expertise** - the [National Cyber Security Centre](#) (NCSC) was established in 2016 as part of the Government Communications Headquarters (GCHQ) and brings together cyber expertise from a wide range of previously disparate cyber organisations. The Centre's main purpose is to reduce the cyber security risk to the UK, working with businesses and individuals to provide authoritative and coherent cyber security advice and cyber incident management, underpinned by world class research and innovation.
- **Investment** - the Government has committed to spend £1.9 billion over the next five years on ambitious policies to protect the UK in cyber space.
- **Personnel** - 250 new entry-level cyber security jobs have been created through the [Tech Partnership](#). Government has also worked with employers to create apprenticeship frameworks in cyber security, such as GCHQ's 50 Fast Track Apprenticeship places.
- **DMARC** - Domain-based Message Authentication, Reporting and Conformance is an NCSC initiative which has helped UK Revenue and Customs to prevent eight million phishing emails from reaching its customers. It is being rolled out across Government.
- **Removing fraudulent websites** - in the last year the NCSC worked with UK Revenue and Customs and Internet Service Providers to remove 13,600 fraudulent websites that were infecting users and stealing information.
- **Detection** - the Department for Work and Pensions' Cyber Resilience Centre analyses events to identify security alerts that require further investigation or intervention.
- **Cyber essentials** - the Government is encouraging businesses and individuals to use Cyber Essentials to reduce the risk of a successful attack.⁹ Nearly 70% of attacks in 2016 could have been prevented by using the Cyber Essentials scheme. A link is below.

Non-Government

- **Business and organisations** - organisations and company boards are responsible for cyber security risks and should ensure their networks are secure. The NCSC provides advice, guidance and free tools to businesses to support them. Training is key: only 22% of small firms had undertaken cyber security training in the past year, rising to 38% of medium size firms and 62% of large firms.
- **Citizen awareness** - members of the public are often targeted by a variety of cyber-attacks, such as scam emails and identity theft. Improving public awareness and resilience to attacks remains a Government priority. Cyber Aware (linked below) is a cross-government awareness and behavioural change campaign delivered by the Home Office in conjunction with the Department for Culture, Media and Sport, and the NCSC.

⁹ 2016 Government Cyber Health Check and Cyber Security Breaches Survey

- **Education** - over 80,000 people are receiving cyber security training through the online course “Introduction to Cyber Security”, funded by the National Cyber Security Programme in the Cabinet Office and developed by the Open University. Lessons in school are also being encouraged to grow future talent.

Collaboration

- **International** - the Government works in partnership with other countries and organisations including the G8, UN, NATO and the EU, to help shape norms of behaviour for cyberspace and promotes the UK as a leader in cyber technology and policy.

NATIONAL CYBER SECURITY STRATEGY 2016-2021

Our vision: we are secure and resilient to cyber threats, prosperous and confident in the digital world



DEFEND

against cyber threats



DETER

our adversaries



DEVELOP

our skills and capabilities

What you should do...

For members of the public, the “Are you Cyber Aware?” link below has helpful password security and software update guidance. These are quick and simple steps that will make your devices (like laptops, tablets, mobiles and home computers) much better protected against the vast majority of cyber attacks. [Additional mobile phone guidance is available.](#)

Business owners should read through the “10 Steps to Cyber Security” guidance linked below, as well as the Cyber Essentials and small business guidance. Even these relatively simple steps will dramatically reduce the threat of successful cyber attacks against you.

The NCSC website provides a wealth of information. NCSC also runs the [Cyber-security Information Sharing Partnership \(CiSP\)](#), designed to bring Government and businesses together to better understand cyber attacks.

Further information online - hyperlinks below

Are you Cyber Aware?	UK Cyber Essentials Scheme	Businesses: Cyber Essentials	Businesses: Small business guidance	Organisations: 10 Steps to Security
National Cyber Security Centre	UK Cyber Security Strategy	Cyber Security Strategy - Progress so far	Get Safe Online	Find out more about GCHQ



Chemical, biological, radiological and nuclear attacks

What's the risk?

The UK Government works hard to prevent terrorists from gaining the expertise and materials necessary to deliver attacks employing chemical, biological, radiological or nuclear (CBRN) materials. Such attacks have the potential to cause harm by contaminating people, animals, buildings, outdoor environments, water supplies and food. Their scale and impacts could vary widely depending on the materials involved and the way they are used. Extremists remain interested in CBRN materials, however alternative methods of attack such as employing firearms or conventional explosive devices remain far more likely.

Smaller-scale incidents could include targeted releases of chemical, biological or radiological materials in indoor or outdoor environments, or assassination. Larger-scale incidents could include the widespread use of biological agents or an improvised nuclear device; resulting in much greater numbers of casualties and widespread, long-term impacts of a magnitude above all other terrorist attacks. Larger-scale attacks of this type have never happened before but would be more challenging to respond to due to the nature of the potential health impacts and widespread environmental contamination. While the likelihood of terrorists successfully conducting a larger-scale CBRN attack in the UK is highly unlikely, it cannot be ruled out.

Consequences of CBRN attacks could vary heavily depending on methods and materials employed, but may include:

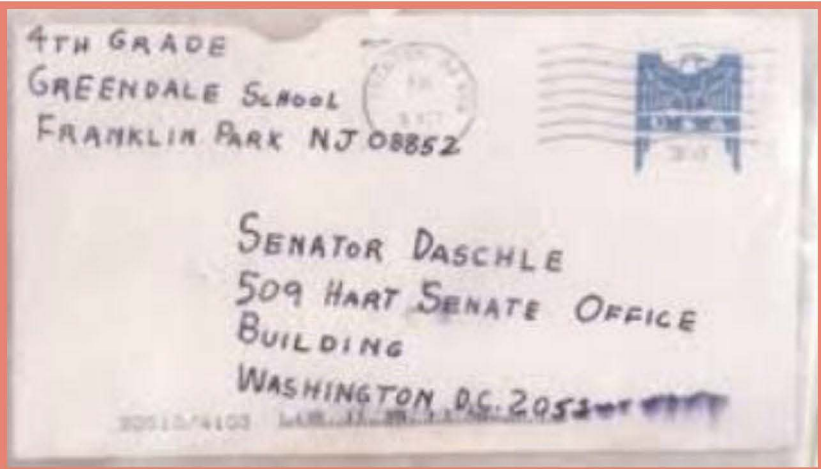
- **fatalities** and physical **casualties** (including contaminated people);
- psychological **casualties**;
- **damage** to property and infrastructure;
- **evacuation and shelter** of affected individuals;
- **disruption** to critical services, particularly transport but potentially across all sectors;
- **economic damage**, including disruption to business and tourism; and
- **environmental contamination**, including the natural and urban environment, animals, infrastructure, food and water.

Has this happened before?

There are relatively few examples of CBRN attacks outside of active warzones. These include: a chemical attack carried out by the terror group Aum Shinrikyo on the Tokyo underground system in 1995, resulting in 13 fatalities and at least 6,300 casualties; letters containing anthrax mailed to government buildings in the USA in 2001, resulting in five fatalities and 17 casualties; and Alexander Litvinenko's death on 23 November 2006 in London from poisoning by polonium (a radiological substance administered via a cup of tea as a means of assassination). In addition, there are isolated examples of production of ricin by both Islamist and far-right extremists, and criminal purchase of abrin by a lone individual. These latter examples did not result in fatalities.

Targeted biological attack
United States of America, 2001

Letter containing *Bacillus anthracis* (anthrax) spores sent to Democratic Senate Majority Leader, Tom Daschle.



What's being done about the risk?

Reducing vulnerability

- **Detection** - the Government is improving methods to detect and monitor CBRN materials, including the means by which terrorists may get hold of them.
- **Protecting emergency responders** - the Government issues protective equipment to specialists such as the Hazardous Area Response Teams in England, Wales and Northern Ireland and Special Operations Response Teams in Scotland.
- **Communications and public awareness** - the Government will ensure further guidance is available during incidents, and is increasing public access to information on what you can do during general emergencies to minimise the risk to you and your family (please refer to Chapter 2).

Limiting adversary capability

- **Material limitations** - tight restrictions on the supply of hazardous substances make it more difficult to get hold of CBRN-related materials or explosives for use in an attack.
- **Stringent border security** - security measures make it more difficult to smuggle weapons or dangerous substances into the UK.

Common capabilities and responses (via a comprehensive, nationwide programme)

- **Planning** - plans to deal with a CBRN incident are kept up to date and regularly tested in exercises.
- **Training** - emergency responders are trained in the immediate steps needed to save lives after a CBRN incident. General responders are supported by specialists across the emergency services trained to operate in hazardous environments.
- **Disposal** - if a device is identified pre-detonation, the police and armed forces possess explosive ordnance disposal capabilities suitable for rendering CBRN devices safe.
- **Medical countermeasures** - the Government maintains national stocks of medical treatments with arrangements in place for how these would be distributed in an emergency.
- **Evacuation and shelter** - local authorities can adapt existing plans for other large-scale incidents to support affected individuals.
- **Decontamination** - the emergency services are trained and equipped to decontaminate large numbers of people. The Government Decontamination Service has mechanisms in place for decontaminating buildings and environments.

- **Government continuity** - plans are in place to ensure effective civil government can continue throughout and after the incident.

Hazardous Area Response Team - training exercise, Welsh Ambulance Service, 2013



What you should do...

If you suspect a CBRN incident, you should inform the emergency services immediately by calling 999. Emergency responders receive specialist training for these types of incidents. They may arrive wearing specialist protective clothing.

The response to a CBRN incident will vary depending on the type of incident, however as is the case for other emergencies you should move away from the immediate source of danger and follow the instructions from the emergency services.

If emergency responders think you may have been exposed to a potentially harmful substance, you could be asked to remain near the scene at a safe location, remove your outer clothing and undergo some form of decontamination (e.g. showering).

For some situations, you may be advised to take shelter in the nearest building. You should then tune in to local and national news media and await further instructions.

[Further information online - hyperlinks below](#)

[CBRN information](#)

[Securing hazardous materials](#)

[Government Decontamination Service](#)

[Protecting food and drink from contamination](#)

CHAPTER 4 -

METHODOLOGY

The risk matrix

The National Risk Assessment (NRA) is the classified Government version of the National Risk Register (NRR). A number of risks in the NRA have been grouped together into more generic categories for the purposes of producing the NRR. This is partly to bring thematic risks together and also due to the sensitivity of the NRA. The position of each category on our risk matrices on pages 9 and 10 is therefore an estimate based on the positions of all the different constituent risks from the NRA, taking care not to undervalue the most serious risks.

How are civil emergency risks identified?

This is done by consulting a wide variety of experts in government departments, devolved administrations and outside of Government in Agencies, academic institutions and industry. This includes the Government's Chief Scientific Adviser network as well as a number of specific groups coordinated by Cabinet Office who have expertise in particular issues such as cyber. Between them these experts can identify instances of possible major accidents, natural events (hazards and diseases) and malicious attacks (threats) that could plausibly happen and could cause significant harm and disruption in the UK in the next five years. Expert groups also help government departments to improve their understanding of the consequences of their risks, such as the effect on the mental wellbeing of the population.

What does this document cover?

Each of the risks in the NRA is described as a 'reasonable worst case scenario'. For a risk to be included in the NRA, they must:

- fulfil the definition of a civil emergency, as described on page 6. Note that long-term trends (such as climate change) increase the chance or severity of civil emergencies (e.g. floods), but do not constitute civil emergencies in themselves;
- have at least a 1 in 20,000 chance of occurring in the UK in the next five years, or in the case of malicious attacks; have a plausibility score of "1" or more (see section on plausibility below); and
- have an expected impact that reaches a minimum threshold (typically significant damage to human welfare in the UK).

How is the likelihood and plausibility of a civil emergency assessed?

Experts assign likelihood scores to each risk on a scale of one to five. For each step on this scale, the probability of an event happening in the next five years increases roughly tenfold. For some risks, data such as historical analysis and numeric modelling can be used to inform estimates of likelihood (especially for naturally and accidentally occurring hazards). Scientific expertise is also sought to

inform the development and review of risks. Where possible, a combination of this analysis and expert judgement is used to estimate the approximate likelihood of an event occurring.

The plausibility of terrorist attacks or other malicious incidents is assessed slightly differently. The willingness of individuals or groups to carry out attacks is balanced against an objective assessment of their capability – now and, as far as possible, over the next five years – and the vulnerability of their potential targets. The two scales are not directly comparable with one another; however, for the purposes of planning, a hazard or threat in the top right quadrant of either matrix would be given the same priority.

How are the impacts of civil emergencies assessed?

We base impacts on the following criteria:

- **fatalities** directly attributable to the incident;
- **casualties** resulting from the incident (including illness, injury and psychological trauma);
- **social disruption** to people's daily lives (such as disruption to transport, healthcare, education, telecommunications, etc.);
- **economic damage** (such as lost tourism or working hours); and
- **psychological impact** on the wider population (including widespread anxiety, loss of confidence in the Government or public outrage).

Each of the dimensions listed above is scored on a scale of 0 to 5 and these scores are then combined to provide a single overall impact score.

Local preparations for emergencies

Most incidents are best managed by local authorities, the affected industry and emergency responders. The Civil Contingencies Act provides a common framework for this activity, putting a duty on emergency planners and responders to identify and assess the risks of emergencies affecting the area in which they operate. The NRA helps this local tier in identifying potential risks and preparing plans for either preventing or mitigating the impact of incidents locally. This work is coordinated through Local Resilience Forums in England and Wales, Regional Resilience Partnerships in Scotland, and Emergency Preparedness Groups in Northern Ireland. These multi-agency partnerships are made up of representatives from local public services, including the emergency services, local authorities, the NHS and the environmental agencies. These local partners also draw on support by other organisations such as Highways England and public utility companies.

The UK Government's Civil Contingencies Secretariat in the Cabinet Office provides guidance on the planning and preparation work coordinated by local partners based on the NRA, as does the Scottish Government in respect of matters devolved to the Scottish Parliament. Many local communities also plan for emergencies and they will want to think about developing their own local risk register as part of their Community Emergency Plan.

Further information on local partners throughout the UK can be found [by following this link](#).

National preparations for emergencies

For each risk of civil emergency, a lead Government department is identified and is responsible for the day-to-day policy oversight, coordination, support and overall management of the central Government response to an emergency. In Northern Ireland, Scotland and Wales, if the matter is devolved (e.g. as with Health), the devolved administration performs the lead Government department function.

For emergencies on a larger scale, the UK Government has developed:

- The [Government's Concept of Operations](#), which sets out the flexible arrangements for coordinating the response to and recovery from emergencies within the UK.
- Contingency plans for responding to the highest priority risks identified in the NRA.
- A [National Resilience Capabilities Programme](#), which aims to build a range of capabilities for emergencies.
- A Strategic National Framework on [Community Resilience](#), which explores the role and resilience of individuals, businesses and communities.

Scotland, Wales and Northern Ireland all have their own resilience arrangements, broadly consistent with those outlined above and drawing on wider UK resources where appropriate. For more information please refer to the resilience websites of [Scotland](#), [Wales](#) and [Northern Ireland](#).

Civil Contingencies Secretariat
September 2017

