World Health Organization
REGIONAL OFFICE FOR **Europe**

Assessment of health-system crisis preparedness

England

December 2011

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Abstract

In 2008, with the support of the European Commission Directorate-General for Health and Consumers, WHO launched the project, "Support to health security, preparedness planning and crises management in European Union, EU accession and neighbouring (ENP) countries", with the aim of improving preparedness for public health emergencies in countries of the WHO European Region. One of the objectives of the project was to test the tool being developed for use in assessing the capacity of health systems for managing crises. The tool, which is based on the WHO health-system framework, was piloted in planning and crises-management assessments carried out in 2007–2008 in Armenia, Azerbaijan and the Republic of Moldova under the joint EC–WHO project, "Support to health security and preparedness planning in EU neighbouring countries". The experience gained in these countries and during a second round of assessments carried out in Poland (2009), Ukraine (2009) and Kazakhstan (2010) contributed to the finalization of the tool, which has since been used in assessments in Turkey (2010), Croatia (2011) and England (2011). This report describes the level of preparedness of the English health system to deal with crises, regardless of cause. It also examines the risk-prevention and risk-mitigation initiatives of the country. While the main focus is on the national level, some attention has been paid to weaknesses in the command structure at the regional level. Recommendations on possible action are included.

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Acknowledgements

Introduction

The number of emergencies and disasters and the severity of their impact have increased worldwide in recent decades, high-income countries being no exception. National and international terrorist groups, while heavily pursued by the police and national security services, continue to add to the list of potential major man-made incidents. This only emphasizes the importance of the role of health systems in the overall cycle of disaster preparedness, risk mitigation, response and recovery.

Strengthening health-system preparedness for crises is not a trivial task. Strengthening stewardship, implementing preparedness planning as a continuous process with a multihazard approach, establishing sustainable programmes on crisis management and health risk reduction programmes, to name a few tasks, requires a clear understanding of the country's situation. Unfortunately, until now, there has been no formally agreed standard methodology for assessing the preparedness of a health system for crises in the WHO European Region. This is not surprising given the diversity of countries in the Region.

The core literature relating to crisis management is rich in descriptions of the limitations of and obstacles to success in this area resulting from failure to adopt a coordinated approach (Annex 1).

The need for a system-wide approach is clear. By anticipating the health needs of the population in the event of a crisis and taking the necessary steps to be prepared, a health system should be able to respond effectively if the situation arises, thus saving lives and alleviating suffering. By providing a summary of the main aspects of emergency preparedness in England in 2011, this report is an important contribution to the evidence base on the preparedness of health systems for crises at both the national and the international levels.

Background

Global health security

The United Nations Commission on Human Security established that good health and human security are inextricably linked and that illness, disability and avoidable death are critical pervasive threats to human security *(1). It identified the three main health challenges as: conflict and humanitarian emergencies; infectious diseases; and poverty and inequity.*

The statistics show a steady rise in the number of disasters worldwide, many of which are attributed to climate change.[1] In the past 20 years, disasters have killed over three million people and adversely affected over 800 million.

Increasingly, disaster management is becoming a priority in countries for the following reasons.

- The economic and political implications of disasters can be significant. Trade and tourism may be severely affected, particularly in the event of an outbreak of communicable disease.

- The effects of climate change have serious implications for global health security. In addition to adverse consequences for the health of individuals, environmental changes may result in mass-population movement and competition for scarce resources, leading in turn to conflict and political instability.

- States Parties to the revised International Health Regulations (2005) (IHR), which came into force on 15 June 2007, are legally bound to meet their requirements *(2)*.

Health security in the WHO European Region

Between 1990 and 2010, approximately 47 million people in the European Region were directly affected by natural disasters that resulted in over 132 000 deaths (Table 1). This does not include the wars and violent conflicts that have killed over 300 000 people in the Region over the last 20 years. Other severe events of the recent past include the Chernobyl nuclear power plant accident in 1986, which the United Nations estimates affected several million people, and the 1999 Marmara earthquake in Turkey, which killed nearly 18 000 people and injured close to 45 000.

Since 1990, a series of violent wars and conflicts in the Region have had vast political, social and human consequences. Armed conflict in Bosnia and Herzegovina, Croatia, Serbia including Kosovo (in accordance with United Nations Security Council resolution 1244/1999), Slovenia and the former Yugoslav Republic of Macedonia resulted in an estimated 125 000 fatalities and the displacement of up to three million people. The break-up of the former Soviet Union brought about a number of violent episodes in Azerbaijan (Nagorno-Karabakh), Georgia (Abkhazia and South Ossetia), the Republic of Moldova (Transnistria), the Russian Federation (Chechnya, Ingushetia, North Ossetia and Dagestan) and Tajikistan, causing the loss of an estimated 200 000 lives.

The recent civil unrest in Kyrgyzstan, where the mass displacement of populations also affected neighbouring countries, underlined the importance of ensuring that national health systems are equipped to respond effectively to the health-security aspects of violence-related crises.

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1 For inclusion in the Centre for Research on the Epidemiology of Disasters (CRED) database, a disaster must have resulted in at least one of the following criteria: 10 or more deaths; 100 or more people affected; a declaration of a state of emergency; a call for international assistance.

Table 1. Crises[a] and their consequences in the WHO European Region (1990–2010)

Type of event	Number of events	Number of deaths	Total number affected	Economic damage (thousands of US$)
Accidents	719	19 424	163 117	13 751 707
Drought	36	2	15 875 969	15 488 309
Earthquake	107	22 002	5 702 222	38 649 449
Epidemic	59	676	216 043	n/a
Extreme temperature	159	81 457	3 452 957	16 865 750
Flood	442	4 221	12 437 525	90 666 061
Mass movement[2]	59	2 298	199 181	1 594 389
Storm	315	1 730	8 861 009	76 582 849
Volcano	4	0	7 000	19 600
Wild fire	77	345	1 295 267	10 768 811
Total	**1 977**	**132 155**	**48 210 290**	**264 386 925**

[a] Excluding conflicts.
[b] Mass movement includes: avalanche, landslide, rockfall and subsidence.
Source: EM-DAT: The OFDA/CRED International Disaster Database (*3*).[2]

A number of serious terrorist attacks have taken place in the Region in the last fifteen years, including those that occurred in France (Paris, 1995), Spain (bombings including the Madrid train attack, 2004), Turkey (various) and the United Kingdom (London, 2005). Reportedly, more than five times as many attacks have been thwarted in Belgium, France, Germany, Italy, the Netherlands, Spain and the United Kingdom, and the list of failed or aborted attempts is probably longer than we may ever know. *(4)*

International Health Regulations

The need to strengthen capacity for emergency preparedness and response, particularly in low-income countries, is firmly based on current trends and statistics and supported by a wide variety of literature on global warming, environmental hazards, bioterrorism and re-emerging and emerging diseases, particularly severe acute respiratory syndrome and avian influenza. The level of international concern about this need is reflected in an increasing amount of media coverage and the establishment of various commissions, committees and international coordinating bodies (e.g. the United Nations International Strategy for Disaster Reduction, the Commission on Human Security and the WHO Health Action in Crises Programme) to address issues related to emergency preparedness and response.

Growing concern about national, regional and international public health security led to the adoption of the revised IHR *(2)* by the 58th World Health Assembly in May 2005. These came into force on 15 June 2007, providing a framework for response to all public health emergencies (not just infectious diseases).

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2 Although methodological problems exist with the data captured by EM-DAT, this database is currently the only one of relevance available.

The 194 States Parties to the IHR *(2)* have a legal obligation to assess and notify WHO of any event of potential international public health concern, irrespective of its cause (biological, chemical or radionuclear) and origin, (accidental or deliberate). The assessment criteria for the international public health implications of any given event include unusual or severe incidents that may have a significant impact on public health, may spread across borders, or may affect freedom of movement (of goods or people).

For effective implementation, States Parties (with WHO support) were also required to develop national IHR implementation plans by June 2009 and to meet national core-capacity requirements by June 2012. How this can be achieved, particularly in low-income countries, is not yet fully envisaged.

Cross-cutting issues related to disaster preparedness and response

Effective crisis preparedness and response is governed by a number of cross-cutting (strategic) principles, which WHO encourages Member States to adopt. These relate to the all-hazards approach, the multidisciplinary (intrasectoral) approach, the multisectoral approach and the comprehensive approach.

The all-hazards approach

Different crises invariably result in similar problems, and responses to them require similar systems and types of capacity. During a crisis, the need to manage information and resources (including human resources), as well as to maintain effective communication strategies, is in essence the same whether the crisis is the result of an earthquake, a flood or a terrorist attack. Hence, WHO promotes a generic, all-hazards approach, actively discouraging the establishment of vertical planning mechanisms while recognizing that each type of crisis requires a specific area of technical expertise.

The multidisciplinary (intrasectoral) approach

Health systems are defined as comprising all the organizations, institutions and resources that are devoted to improving, maintaining or restoring health. This includes public and private initiatives (for example, by nongovernmental organizations (NGOs) and international agencies) and action at central-government, local-government, population and military levels – from tertiary care to community health care – all of which may have a role to play during a crisis. WHO, therefore, encourages transparency and interoperability in the planning process and promotes the involvement of all disciplines and all levels of the health system to ensure a coordinated and effective response, making the best use of often scant resources and ensuring that plans are appropriate and feasible.

The multisectoral approach

Health-sector plans also need to be linked to and interfaced with national plans for disaster preparedness and response to avoid confusion, prevent duplication of effort and make the best use of resources. This is important not only during a crisis but also as part of prevention, reduction and mitigation strategies. Other governmental departments, private enterprises and commercial organizations can play an important role in reducing the negative health effects of, for example, inappropriate urban development and use of land, poor agricultural practices and inadequate legislative procedures.

The comprehensive approach

The economic consequences of a crisis can be enormous. The reduction, prevention and mitigation of the related risks are priority areas that increasingly need to be taken into consideration when planning national crisis preparedness and response. Therefore, WHO encourages Member States to develop and implement strategies for the different aspects of crisis-preparedness planning, bearing in mind that they are not separate entities but overlap in scope and time frame. They can be summarized as follows.

- *Prevention, reduction* and *mitigation* activities aim to reduce the likelihood or impact of a disaster and, in the health sector, are devoted mainly to ensuring the functionality of the health facilities and key installations in the aftermath of a disaster.

- *Preparedness* requires a multidisciplinary, multisectoral planning process to strengthen the capacity and capability of systems, organizations and communities so that they can better cope with emergencies.

- Action related to *response* and *recovery* covers a wide range of activities implemented during and after an emergency, which have specific humanitarian and social objectives linked to long-term strategic goals and sustainable development.

For programmatic purposes, WHO has designed specific activities aimed at preventing, mitigating and preparing for emergencies, disasters and other crises. For the purpose of this document, the following definitions apply.

- *Risk reduction* involves measures designed either to prevent hazards from creating risks or to lessen their distribution, intensity and/or severity. These include flood-mitigation works and the planning of appropriate land use. They also include vulnerability reduction measures, such as awareness-raising, improving community-health security, and relocating or protecting vulnerable populations or structures.

- *Emergency preparedness* is a programme of long-term activities, the goals of which are to strengthen the overall capacity and capability of a country or a community to manage all types of emergencies efficiently and bring about an orderly transition from relief through recovery to sustained development. It requires the development of emergency plans, the training of personnel at all levels and in all sectors, and the education of communities at risk. These measures should be monitored and evaluated regularly.

In 2007, the European Commission Directorate-General for Health and Consumers and the WHO Regional Office for Europe embarked on a joint project to develop a standardized assessment tool, which would support Member States in objectively evaluating the preparedness of their health sectors to respond to natural and man-made disasters, taking all functions of the health system into consideration. Other aspects for inclusion in the evaluation were priority health risks and the interoperability of public health emergency plans. The project was coordinated by the Regional Office.

A multidisciplinary team of experts in the areas of disaster preparedness, communicable diseases and environmental health worked together to elaborate, refine and pilot the tool. Baseline assessments were conducted in Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Poland, the Republic of Moldova and Ukraine in connection with which comprehensive reports were delivered to the beneficiary countries highlighting strengths, weaknesses and gaps in organizational, legal and policy frameworks for planning national health-system preparedness. Furthermore, in collaboration with the ministries of health and the key stakeholders in these countries, a framework was developed for strengthening the preparedness of health systems.

The need to test this methodology in a western European country was apparent. In the light of the fact that the venue for the 2012 Olympic Games is London, it was considered appropriate to carry out an assessment of the English health system's preparedness for crises. In agreement with the Department of Health, this assessment took place in November–December 2011.

Country overview

Geography

England is one of the four countries of the United Kingdom, an island group in western Europe situated between the Atlantic Ocean and the North Sea and separated from continental Europe by the English Channel. The other countries of the United Kingdom are Northern Ireland, Scotland and Wales.

The climate is predominantly temperate and moderated by prevailing south-westerly winds over the North Atlantic current. More than half of the days are overcast. The terrain consists mostly of rugged hills and low mountains that level to rolling plains in the east and south-east.

History

England became a unified state in AD 927. Since the 15th century, it has had a significant cultural and legal impact on the wider world. The English language, the Anglican religion, and English law (the basis for the common-law legal systems of many countries around the world) and the country's parliamentary system of government have been widely adopted by other nations. In the 18th century, the Industrial Revolution transformed England into the world's first industrialized nation. The Royal Society of London for the Improvement of Natural Knowledge laid the foundations of modern experimental science.

Government

As part of the United Kingdom, England is a constitutional monarchy but is ruled directly by a democratically elected parliament using the "first-past-the-post" electoral system. In the House of Commons, the lower house of the British Parliament based at the Palace of Westminster in London, the capital city, 532 of the 650 Members of Parliament (MPs) for the whole of the United Kingdom are for constituencies in England. The country is comprised of 36 metropolitan districts and 78 unitary authorities, as well as 32 London boroughs. The United Kingdom is a member of the European Union but retains its own currency – the pound sterling (£).

Economy

The economy of the United Kingdom is the third largest in Europe (after (1) Germany and (2) France) and is based largely on business services and industry. England itself has an average yearly gross domestic product (GDP) per capita of £22 907. The country has natural resources, such as coal, petroleum, natural gas, iron ore, lead, zinc, gold, tin, limestone, salt, clay, chalk, gypsum, potash, silica sand and slate, and about 23% of the land is arable. In 2008, the global financial crisis hit the economy particularly hard. In the latter half of that year, sharply declining home prices, high consumer debt, and the global economic slowdown compounded the United Kingdom's economic problems, pushing the economy into recession. In 2010, in the face of burgeoning public deficits and debt levels, the coalition government initiated a five-year austerity programme.

Population

England is by far the most populous country of the United Kingdom with over 51 million inhabitants (84% of the combined total population) and an average density of 395 people per square kilometer. It has a population growth rate of 0.553% per year, a total fertility rate of 1.91 children per woman and an average life expectancy at birth of 80.05 years. Table 2 illustrates the age distribution of the population in 2011.

Table 2. Age distribution of the population of England, 2011

Age group (years)	Proportion of population (%)
0–14	17.3
15–64	66.2
65+	16.5

Source: The World Fact Book *(5)*.

Health

The health of the population in England has improved over the last few decades. Between 1981 and 2008, life expectancy at birth increased by 5.1 years for women (to 82.1 years) and 6.9 years for men (to 78.0 years). In addition, mortality rates declined for most major diseases, with large falls in the three major categories: respiratory diseases (by 56% for men and almost 30% for women); cancers (by 22% for men and 10% for women); and circulatory disease (by approximately 64% for both men and women). Infant and perinatal mortality rates have decreased dramatically since 1976. Infant mortality fell from 14.2 per 1000 live births in 1976 to 4.7 in 2008, while perinatal mortality fell from 17.6 deaths per 1000 live births to 7.6 over the same period. However, inequalities in health across socioeconomic groups have been increasing since the 1970s. For example, life expectancy at birth for males born in England and Wales between 2002 and 2005 was 7.3 years shorter for those in the unskilled class than for those in the professional class; for females, the difference was 7.0 years *(6)*.

The health-care system

The National Health Service (NHS) was formed following the National Health Service Act of 1946 and is the publicly funded health-care system in England responsible for providing most of the health care in the country. NHS is funded largely from general taxation, including national insurance payments, and provides most of its services free at the point of use (there are some charges for eye tests, dental care and prescriptions). The government department responsible for NHS is the Department of Health, headed by the Secretary of State for Health, who sits in the Cabinet Office. Most of the expenditure of the Department of Health is attributable to NHS. In 2008–2009, this amounted to £98.6 billion. In addition, 12% of the population are covered by private medical insurance, which is used largely for acute elective care.

Health regions

To administer NHS, the Department of Health divided the country into strategic health authorities (SHA), which have been amalgamated into four SHA clusters (Fig. 1). This structure is due to end in 2013 with the introduction of an NHS commissioning board. SHA are further divided into 150 NHS primary-care trusts, which control three quarters of the NHS budget and are responsible for commissioning hospital, general-practitioner and community-health services for their local populations. Seventy per cent of the boundaries of primary-care trusts coincide with those of local government authorities. *(7)*

Increasing resilience and potential threats

In its National Security Strategy (2010) *(9)* and Strategic Defence and Security Review (2010) *(10),* the Government prioritized the need to improve the security and resilience of the infrastructure most critical to keeping the country running in the face of attack, damage or destruction. International terrorism, cyber attacks, major accidents and natural hazards are identified as being among the most serious risks to the security of the United Kingdom.

Fig. 1. SHA clusters in England

North Cluster

North East

North West

Yorkshire & Humber

Midlands Cluster

East Midlands

West Midlands

East Of England

South Central

London Cluster

South West

South East Coast

South Cluster
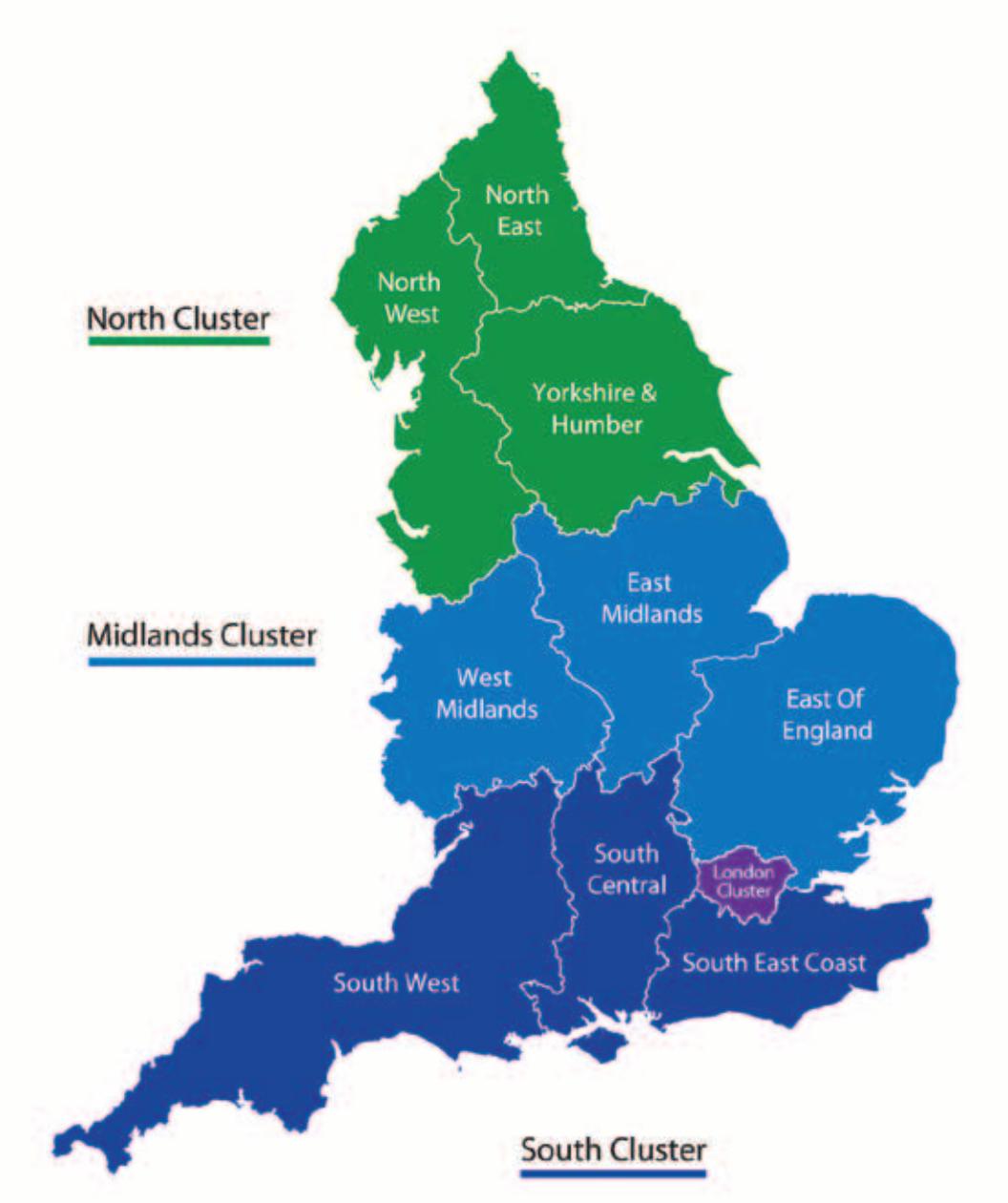
Source: NHS Mapping 2011 *(8).*

Mission objectives and deliverables

The objective of the assessment was to produce a report on England's arrangements for crisis management, including health-system capacity. The report aims to broaden the evidence base of best practices in health-system crisis preparedness and includes recommendations for consideration. While the assessment focused mainly on preparedness for mass gatherings and extreme events at the national level, England's capacity for and experience in supporting other countries in their preparation for and response to such situations were also taken into account.

Methodology

To gain an understanding of the health structure and emergency preparedness in England, the assessment team (Annex 2) reviewed relevant official documentation available on government web sites. The core sources were legislative documents, non-statutory guidance and government papers. Annex 3 lists the key documents reviewed during the assessment.

Structured interviews were then carried out with experts in the key subject matter in relevant departments and organizations (Annex 4), using questionnaires based on the WHO *Toolkit for assessing health-system capacity for crisis management (11).* The transcripts were catalogued, reviewed and expanded on to add depth to the report.

Other experts in the subject matter were involved through an on-line survey carried out with the help of the Emergency Planning Society.

The review team visited specific sites, such as ambulance and hospital trusts, and attended emergency-planning exercises at level of the local-resilience-forum.[3]

A workshop was held with the key experts involved to review the report and discuss the recommendations. The writing team is listed in Annex 5.

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3 A local resilience forum is a multiagency partnership made up of representatives of category-1 (mainly) and category-2 responder organizations. Its aim is to plan and prepare for crises.

Findings of the Assessment

1 Leadership and governance

1.1 Legal framework for national multisectoral emergency management

Civil Contingencies Act 2004

The Civil Contingencies Act 2004 is an enabling act of Parliament closely supported by specific regulations (The Civil Contingencies Act 2004 (contingency planning) Regulations 2005) and statutory guidance on emergency preparedness. The Act delivers a single framework for civil protection in the United Kingdom and is regarded as a strong and very useful tool for directing and facilitating emergency planning in England. Details of this framework can be found in the regulations and guidance mentioned above (Annex 3).

The Act is separated into two substantive parts: (1) local arrangements for civil protection; and (2) emergency powers. It has increased the legislative requirements of a number of organizations classed as either category-1 or category-2 responders to a major incident. Table 3 lists some of the principle responders and their main functions although all work together as required. *(12)*

Table 3. Category-1 and category-2 responders to a major incident and their functions

Category	Responders	Functions of responders
1	Emergency services (police, fire, ambulance)	Assessment, planning and provision of advice
	Primary and acute NHS organizations	Participation in local resilience forums
	Health Protection Agency	Maintenance of community-risk register
	Environment Agency	Maintenance of certain incident plans
	Maritime and Coastguard Agency	Training
	Local authorities	Information-sharing, as required
2	Health and Safety Executive	Heavy involvement in incidents affecting their sectors
	Strategic health authorities	Provision of advice and expertise on request
	Transport and utility companies	Information-sharing, as required

Source: Stuart-Black S, Stuart-Black J, Coles E, eds. *Health emergency planning: a handbook for practitioners (2nd edition).* London, The Stationery Office. 2008 *(12)*.

International Health Regulations 2005

IHR *(2)* are an international instrument that is legally binding for all countries that are States Parties to the Regulations. Their scope and purpose are to prevent, protect against, control, and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks and avoid unnecessary interference with international traffic and

trade. In accordance with the IHR requirement that States Parties designate a national IHR focal point accessible at all times to the WHO IHR contact point, the British Government has appointed the Health Protection Agency to carry out this function.

Health and Safety at Work Act 1974

The Health and Safety Executive is responsible for enforcing health and safety legislation related to the health services, which includes the general duties listed under the Health and Safety at Work Act 1974, and a set of regulations relevant to major incident planning in the Health and Safety at Work Regulations 1999. The latter require employers to: assess risks to their employees while at work, and to others, which may arise in the course of their undertakings; identify measures required to control those risks; and have adequate written procedures for planning, organizing, controlling, monitoring and reviewing those measures *(13)*.

The following legislation, drawn up under the Health and Safety at Work Regulations 1999, are of major relevance for those involved in managing chemical incidents.

- Notification of Installations handling Hazardous Substances Regulations 1982
- Control of Asbestos at Work Regulations 1987
- Control of Asbestos in the Air Regulations 1990
- Chemical Hazard Information and Packaging Regulations 1994
- Control of Substances Hazardous to Health Regulations 1994
- Control of Lead at Work Act 1998
- Control of Major Accident Hazards Regulations 1999.

Legislation related to local authority

There are a number of acts of Parliament and regulations that govern the way in which local authorities undertake civil defence and respond to emergencies. The following are examples of these.

- Local Government Act 1972 (amended 2002) allowing local authorities to use funds to "avert, alleviate or eradicate" the effects of disasters *(14)*.
- Control of Major Accidents Hazards Regulations 1999.
- Radiation (Emergency Preparedness and Public Information) Regulations 2001.

1.2 Legal framework for health-sector emergency management

The need for hospitals to plan for major incidents was first recognized in the National Health Service Act 1977. The Act required all hospitals with accident and emergency departments (now acute trusts) to have an emergency plan in place that could be put into action in the event of a major incident. Primary Care Trust Functions (Amendment) Regulations 2002 require primary-care trusts to carry out planning for major incidents in accordance with Sections 2–5 of the National Health Service Act 1977. Chief executives of primary-care trusts are responsible for ensuring that plans and arrangements are in place for their own trusts, including collaborative agreements with neighbouring NHS organizations and partner agencies. Nominated lead primary-care trusts carry out the coordination function previously undertaken by health authorities.

Care Quality Commission

All NHS trusts are required to register with the Care Quality Commission, which is an independent

body that regulates health care and adult social care in England. Trusts' plans for major incidents and emergencies is subject to unannounced inspection by the Commission.[4]

1.3 National institutional framework for multisectoral emergency management

Preparedness

The National Security Council coordinates and delivers the Government's national and international security agenda. In coordinating responses to dangers faced in the United Kingdom, the Council integrates, at the highest level, the work of the departments for foreign affairs, defence, home affairs, energy and international development, and all other arms of government contributing to national security. The Council is chaired by the Prime Minister; permanent members are the Deputy Prime Minister, the Chancellor of the Exchequer, the Secretary of State for Foreign and Commonwealth Affairs, the Home Secretary, the Secretary of State for Defence, the Secretary of State for International Development and the Minister for Security.

Ministerial representatives and officials groups also meet as part of the National Security Council Threats, Hazards Resilience and Contingencies Committee.

The Civil Contingencies Secretariat in the Cabinet Office coordinates the work of the British Government to enhance the country's resilience to the full range of emergencies. This work is carried out by departments responsible for contingency planning and response within their areas, such as infectious diseases, which falls under the Department of Health, and fuel disruption, which is under the Department of Energy and Climate Change.

Emergency Preparedness Division of the Department of Health

The Emergency Preparedness Division:

- advises ministers on the development of policy;
- is accountable to ministers through the Chief Medical Officer;
- ensures NHS and social-care preparedness;
- contributes to/leads the central government response (e.g. through the Cabinet Office Briefing Rooms[5] or the Civil Contingencies Committee);
- coordinates national and international arrangements;
- oversees and supports the response of NHS and partner organizations during a complex national emergency and ensures their resilience;
- contributes to central-government work on communications;
- handles the national media;
- provides the media, health professionals and the public with authoritative material.

The principal mechanism for multiagency cooperation at the local level is the local resilience forum, the purpose of which is to:

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4 Information on the Care Quality Commission's health and social care regulations is available at http://www.cqc.org.uk/organisations-we-regulate/registered-services/legislation, accessed 25 March 2012.

5 The Cabinet Office Briefing Rooms are a government crisis-management facility that is activated in cases of national or regional emergency. It is often headed by the prime minister.

- provide a local forum for local issues;

- help coordinate risk assessment by developing a community-risk register;

- facilitate category-1 and category-2 responders in carrying out their duties;

- help deliver government policy by coordinating local response to government initiatives;

- help define the procedures to be followed by the relevant local responders in forming a strategic coordinating group[6] in the event of an emergency.

Response

There are three main levels of emergency that require central-government response: (1) a significant emergency; (2) a serious emergency; and (3) a catastrophic emergency (Table 4).

Table 4. Levels of emergency requiring central government response

Emergency level	Impact level	Response required
Level 1: significant emergency (e.g. severe weather problems)	Low	Coordinated action of government and emergency services
Level 2: serious emergency (e.g. a terrorist attack)	Wide or prolonged	Sustained central-government coordination (from the Cabinet Office Briefing Rooms)
Level 3: catastrophic emergency (e.g. a major natural disaster)	Widespread	Immediate government support national-level response led by the Prime Minister

A **significant emergency** (level 1) requires the involvement or support of central government, primarily of a leading government department or a devolved administration, in collaboration with the emergency services, the local authorities and various other organizations. There is, however, no actual or potential requirement for fast interdepartmental or interagency decision-making, which might necessitate the activation of a collective central-government response. Examples of emergencies on this scale include most severe weather-related problems, such as localized flooding.

A **serious emergency** (level 2) is one, which has, or threatens to have, a wide and/or prolonged impact requiring sustained central-government coordination and the support of a number of departments and agencies. The central-government response to such an emergency would be coordinated from the Cabinet Office Briefing Rooms by the lead government department. Examples of an emergency at this level are a terrorist attack, widespread urban flooding, widespread and prolonged loss of essential services, a serious outbreak of animal disease, or the occurrence of a major emergency outside the country, which significantly affects the British population.

A **catastrophic emergency** (level 3) is one with an exceptionally high and potentially widespread impact requiring immediate central-government direction and support. This could be a major natural disaster, or an industrial accident on the scale of the Chernobyl disaster (Ukraine, 1986). Characteristics of the response might include a top-down approach in circumstances where the local response was overwhelmed, or where it was necessary to use emergency powers to direct the response and/or requisition assets and resources (Fig. 2). In a catastrophic emergency, the

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6 A strategic coordinating group, chaired by the police gold commander, consists of gold commanders from all main agencies/sites involved in an incident.

Prime Minister would lead the national response. Fortunately, the United Kingdom has had no recent experience of a level-3 emergency. The Department of Health's document, *Beyond the major incident (15),* provides the NHS with guidance on planning for a level-3 emergency.

Fig. 2. Likely form of central-government engagement based on impact and geographic spread of an emergency in England

<u>**ANNEX B: LIKELY FORM OF CENTRAL GOVERNMENT ENGAGEMENT BASED ON THE IMPACT AND GEOGRAPHIC SPREAD OF AN EMERGENCY IN ENGLAND**</u>
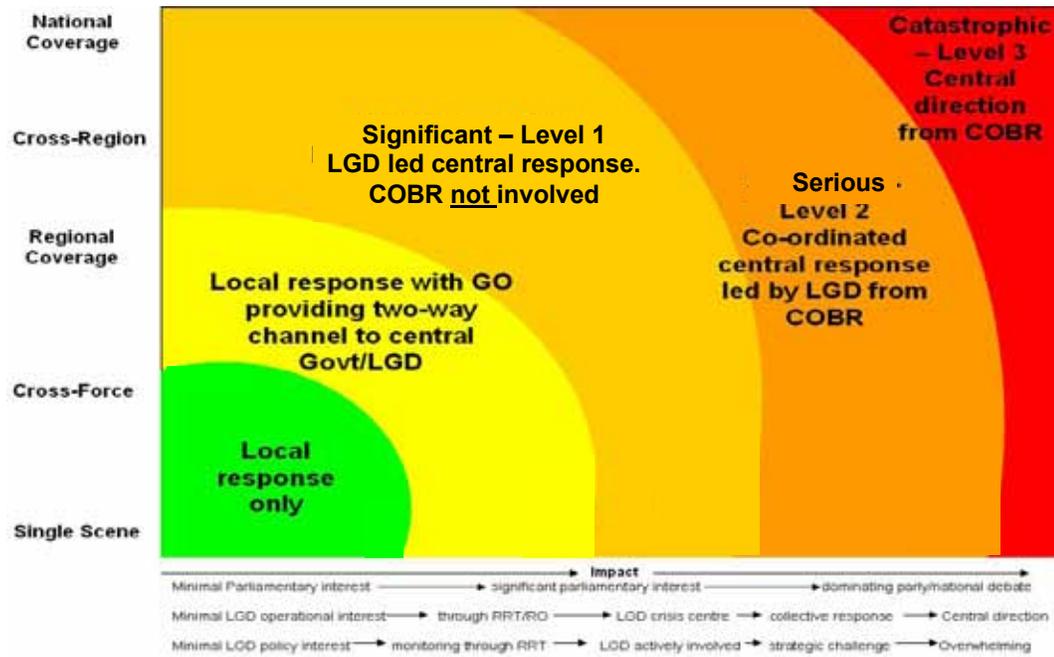
Notes: COBR = Cabinet Office Briefing Rooms; LGD = lead government department; GO = Government office; Govt = government.
Source: Responding to emergencies – the UK central-government response. Concept of operations. London, Cabinet Office, 2010 *(16)* http://webarchive.nationalarchives.gov.uk/+/http://www.cabinetoffice.gov.uk/media/349120/conops-2010.pdf, accessed 12 April 2012).

The control and coordination of emergency response in England are carried out at three levels of command: strategic (gold command), tactical (silver command) and operational (bronze command) (Table 5).

Table 5. Application of the gold, silver and bronze commands

Level of command	Control and coordination of response
Strategic: GOLD	At the strategic level, the gold command is active in cases where it is clear that the resources, expertise or coordination required are beyond the capacity of the silver command (tactical level). The gold commander of the organization in charge of the response, typically the police force, sets up a strategic coordinating group, bringing together the gold commanders of other relevant organizations, such as the ambulance service, NHS and public health. Each commander is in control of his/her organization's resources at the scene of the incident. The gold commander is not located at the site of the incident but participates in developing the response strategy in the designated control room.
Tactical: SILVER	At the tactical level, the silver command deals with the overall management and resourcing of frontline response in accordance with the strategy set by the gold command. The most senior officers of each organization involved in the operations, which include NHS and public health, form a tactical coordinating group to manage the response at that level, defining action to be taken by the bronze command (operational level). The silver commander, who is not normally located at the scene of the incident, reviews the resources at the operational level (bronze command) and works closely with silver commanders of other agencies. The silver command may also take charge of bronze's resources to implement the strategy of the gold command.
Operational: BRONZE	The bronze command (operational level) operates at the scene of the incident and at the receiving NHS hospitals. The bronze commander concentrates efforts and resources on specific tasks within the bronze command's area of responsibility. As management of an incident can become complex, it may be necessary to establish a number of bronze areas so that, for example, at the scene of a train crash, each railway carriage may be under the responsibility of a separate bronze command. If an incident is geographically widespread, the area involved would be divided into different locations, each of which would be under the responsibility of a different bronze command.

Source: Emergency response and recovery. Chapter 4. In: *Responding to Emergencies. Version 3.* London, HM Government, 2010 *(17).*

Case study 1. Fire at Buncefield oil depot

At 06:01 hours on 11 December 2005, a series of explosions occurred at the Buncefield oil depot of the Hertfordshire Oil Storage Terminal, which was the fifth-largest storage depot for oil products in the United Kingdom with a capacity of 272 765 400 litres of fuel. The emergency services announced a major emergency at 06:08 hours and led the initial response to the incident and its aftermath.

© Hertfordshire Constabulary, courtesy of Health Protection Agency.

To resolve the Buncefield incident, a strategic coordinating group was established, comprising representatives of all agencies deployed for the response, including the Health Protection Agency and the Environment Agency as category-1 responders, in accordance with the Civil Contingencies Act 2004. The group decided that:

- the gold command should be located at some distance from the fire;
- the silver command should be located close to the fire;
- the bronze command should be situated at the site of the fire.

The three key health-related functions of the group were: ambulance strategic command; NHS strategic command; and provision of public health advice. During the first three days of the fire, the group met at 09:00, 11:00 and 14:00 hours. Each session was followed by a media briefing. The meetings were attended by the commanders of the main emergency services, primary-care trusts and local authority, as well as health and safety officials and civilian press officers from the emergency services.

1.4 National institutional framework for health-sector emergency management

The institutional framework for health-sector emergency management is underpinned by the online resource, *NHS Emergency Planning Guidance 2005*, issued by the Emergency Preparedness Division of the Department of Health *(18)*. This document provides strategic guidance on emergency planning at the national level for all NHS organizations in England.

All chief executive officers of NHS organizations are responsible for ensuring that their organizations have a major-incident plan based on the principles of risk assessment, partnership, emergency planning, communication with the public and information-sharing. The plan should be linked to the organization's arrangements for ensuring business continuity, as required by the Civil Contingencies Act 2004. It is considered good practice for NHS organizations to designate an adequately resourced officer, usually referred to as the emergency-planning liaison officer, to support the person responsible for emergency-preparedness activities.

SHAs must immediately notify the Emergency Preparedness Resilience and Response Division of the Department of Health in the case of:

- a major incident resulting in a large number of casualties;
- an incident that might generate government interest;
- a terrorist or suspected terrorist attack;
- an incident requiring the assistance of the Department of Health.

The Emergency Preparedness, Resilience and Response Division is staffed by officials of both the Department of Health and NHS. Their duties are:

- to advise ministers on the development of policy;
- to ensure, and be accountable for, the preparedness of NHS and the social-care services (through the chief medical officer);
- to contribute to development of the agenda (e.g. of the Cabinet Office Briefing Rooms or the Civil Contingencies Committee) for central-government response;
- to implement national and international coordination arrangements for overseeing and supporting the response of NHS and partner organizations;
- to ensure the resilience of NHS and partner organizations;
- to take command of NHS during a complex national emergency incident;
- to contribute to central-government work on communications;
- to issue authoritative material to the media, health professionals and the public; and
- to handle the national media.

1.5 Components of national programme on health-sector emergency management

In complex, large-scale incidents, a strategic coordinating group is formed to allow the organizations involved to share information and coordinate a strategic response. In the majority of cases, the group, which is generally chaired by the police gold commander, operates at the geographical level defined by local boundaries of the police force. The group has three key health-related functions: to provide ambulance strategic command, NHS strategic command, and public health advice.

If a large-scale incident threatens to overwhelm local responders or impact a wide area, a regional civil contingencies committee may be formed to coordinate a region-wide response. The committee would include representatives of the organizations that regularly attend the local resilience forums, and other organizations and agencies as required. *(18)*

Proposed developments

The structures and functions of health- and public-health-related emergency preparedness and response are being adapted (2011–2012) to reflect the changes to the health system that, subject to Parliamentary approval, will be introduced by the Health and Social Care Bill. They have been designed and planned with health partners and their introduction will not affect the robustness of the health system.

Some of the management functions described in this report will be moved to new organizations as part of an overall transition programme. Most provider and responder organizations will not be affected by the changes.

The Department of Health, together with the emerging new organizations, such as the NHS Commissioning Board and Public Health England, is taking the opportunity to strengthen the emergency preparedness and response systems and ensure that they are aligned to wider cross-government and cross-agency civil-contingency structures, such as those to reinforce health-planning capabilities at the local-resilience-forum level. The health-system changes will also see the transfer of elements of public health planning and response to local authorities to be managed alongside other aspects of civil-contingency planning and response. This will ensure that local as well as national priorities and risks are taken into account in emergency planning and response.

It is planned to carry out exercises to test the new system, which should come into effect in April 2013.

2 Health Workforce

2.1 Human resources for health-sector emergency management

In 2011, the NHS workforce in England consisted of 1.35 million employees. Nursing staff form the largest group of health-care personnel, making up over 27% of the total workforce. In the same year, the total number of doctors working in NHS in England was 143 836 (134 713 full-time equivalents), which represents an increase of 57 252 since 1996 or a 3.6% annual increase over the period 1996–2011. However, with 2.7 practising doctors per 1000 population in 2010, the latest available figure, the number of doctors per capita in England is one of the lowest in the European Union (EU). In 2009, the latest available figure, the EU average was over 3.3 doctors per 1000 (Fig. 3).

The total number of nurses, midwives and general practitioner (GP) practice nurses working in NHS in England in 2011 was 370 327 (319 919 full-time equivalents), an increase of over almost 50 000 since 2001, representing an annual growth rate of 1.5%.

In 2011, the total number of ambulance staff was 32 925 (30 825 full-time equivalents). Of these, 18 687 (56%) were qualified ambulance staff (e.g. emergency-care practitioners, paramedics, ambulance technicians), and the remaining 14 238 (44%) were trainees and general support staff.

All medical practitioners are required to be registered with the General Medical Council while nurses, paramedics and other health-care workers are now registered with the Health Professions Council.[7]

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7 Further information about the Health Professions Council available at: http://www.hpc-uk.org/, accessed 25 March 2012.

Fig. 3. Number of doctors per 1000 population in England, selected countries and EU, 1996–2010
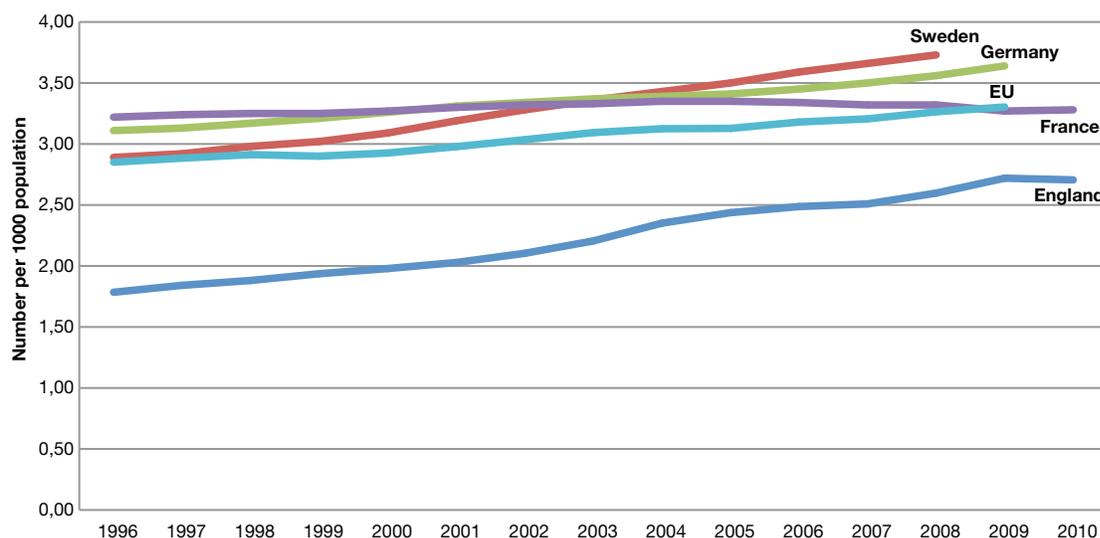
The voluntary sector is incorporated in emergency responses at the regional and local levels. This is indicated in the Civil Contingencies Act 2004 and is expanded upon in the government publication, *Emergency preparedness* (Annex 3, point 2).

International aid for mass-casualty incidents occurring in the United Kingdom is requested and coordinated via the Department of Health and the Foreign Office. Incoming medical practitioners must be registered with the relevant regulatory body in the United Kingdom before being able to practice there.

Emergency Planning Society

The professional organization for emergency planners is the Emergency Planning Society[8]: The Society and its branches organize conferences, workshops, working parties, studies and seminars to examine emergency-planning practice and experience, and develop advice on good practice. Resulting information and reports are disseminated throughout the emergency-planning community.

Charities

Charities include the Institute of Civil Protection and Emergency Management founded in 1938[9], which provides consulting services for the government, the media and commercial sectors, and Disaster Action[10], a charity based in the United Kingdom, which offers guidance and support worldwide. The Faculty of Conflict and Catastrophe Medicine, part of The Worshipful Society of Apothecaries of London[11], offers the Diploma in the Medical Care of Catastrophes.

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8 Further information about The Emergency Planning Society available at: https://www.the-eps.org/, accessed 15 April 2012.

9 Further information about The Institute of Civil Protection and Emergency Management available at: http://www.icpem.net/, accessed 26 March 2012.

10 Further information about Disaster Action available at: http://www.disasteraction.org.uk/, accessed 26 March 2012.

11 Further information about The Worshipful Society of Apothecaries of London available at: http://www.apothecaries.org/index.php?page=2, accessed 26 March 2012.

Training and exercises for health-sector emergency management

As a minimum requirement, NHS organizations are required to undertake a live exercise every three years, a table-top exercise every year and a communications-cascades test every six months *(18)*. The Department of Health commissions the Health Protection Agency to design and develop training programmes and specific table-top and live exercises. Multiagency exercises are held annually in each region to test specific areas of identified risk. Lessons learnt from these exercises are shared widely across the health community and with specific local responders.

Specialists in emergency medicine and providers of prehospital care receive training in the etiology and management of major incidents. Qualifications, such as the Fellowship of the College of Emergency Medicine and the Diploma in Immediate Medical Care and Fellowship in Immediate Medical Care offered by the Faculty of Pre-Hospital Care of The Royal College of Surgeons of Edinburgh, require an in-depth knowledge of the management of major incidents. In addition, the Faculty of Pre-Hospital Care is developing a diploma in major-incident management. There are also courses available leading to post-graduate qualifications, such as the Masters in Health Incident Command degree offered by Manchester Metropolitan University.

Health-emergency planning programme

The Health Protection Agency runs a health-emergency planning programme in conjunction with Loughborough University. Programme courses, which were launched in 2011, lead to three new qualifications in health-emergency planning: the Award; the Certificate; and the Diploma. Developed from the original diploma (introduced in 2005), these qualifications have been mapped against the national occupational standards related to civil protection and endorsed by Skills for Health[12]. The new diploma is the only level-four (undergraduate) qualification in the United Kingdom, which focuses specifically on health-emergency planning.

Emergency Planning College

The Emergency Planning College[13], positioned within the Civil Contingencies Secretariat of the Cabinet Office, delivers training in emergency planning and crisis management to a wide range of participants. The College aims to enhance national resilience through training provided by the United Kingdom's leading experts in emergency planning and crisis management. It also offers training and consultancy to countries across the world.

Major-incident medical management and support

Three-day courses leading to the qualification, "Major-incident medical management and support (MIMMS)" are open to applicants with a medical, nursing or paramedic background. They are administered by the Advanced Life Support Group *(23)* and qualify responders for a period of four years. MIMMS training, although encouraged, is not a statutory requirement for hospital staff. A variant of MIMMS is the course entitled, "Hospital major-incident medical management and support", which is shorter than MIMMS and tailored more for hospital staff. Managers and clinicians, who may be involved in managing the response to a major incident from within the hospital, can apply to take this course.

Most hospital emergency departments include an overview of their major- incident plans in their induction programmes for new staff. All staff of NHS Trusts is required to know how to access the trust's major incident plan, if required.

As a minimum requirement, NHS organizations are required to undertake a live exercise every three

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12 Further information on Skills for Health available at: http://www.skillsforhealth.org.uk/, accessed 18 March 2012.

13 Further information on the Emergency Planning College available at: http://epcollege.com/epc/home, accessed 18 March 2012.

years, a table-top exercise every year, and a communications-cascades test every six months *(18)*. The Department of Health commissions the Health Protection Agency to design and develop training programmes and specific table-top and live exercises. Multiagency exercises are held annually in each region to test specific areas of identified risk. Lessons learnt from these exercises are shared widely across the health community and with specific local responders.

3 Medicinal products, vaccines and technology

3.1 Medical supplies and equipment for emergency response operations

Extra medical equipment for use in supporting a wide range of catastrophic incidents is strategically placed across the United Kingdom. This equipment is designed to cater for chemical, biological or radiological exposure as indicated, and includes ventilators, dressings and drugs (including antidotes). It is maintained and deployed by the ambulance trusts. Fig. 4 exemplifies personal protective equipment for health-care staff.

Fig. 4. Personal protective equipment for health-care staff

Source: Health Protection Agency.

Responsibility for the decontamination of casualties is shared between the Fire and Rescue Service and the ambulance trusts. Emergency departments are also required to provide decontamination facilities *(24)*.

Blood-transfusion services

The donation, control and distribution of blood in England are highly evolved. A unit of blood product can be traced all the way from recipient to donor even many years after the transfusion was administered. NHS Blood and Transplant is a SHA found in England and Wales. It was established on 1 October 2005, bringing together the former National Blood Authority and United Kingdom Transplant. It supplies around 2 million units of blood a year to hospitals in England and Wales and to military operations deployed overseas. The roles of NHS Blood and Transplant include:

- encouraging people to donate blood, tissues and organs;

- optimizing the safety and supply of blood, tissues and organs;

- helping to raise the quality, effectiveness and clinical outcomes of blood and transplant services;

- providing expert advice to other NHS organizations, the Department of Health and devolved administrations;

- providing appropriate advice and support to health services in other countries;

- commissioning and conducting research and development;

- actively engaging in the implementation of relevant EU statutory frameworks and guidance;

- being involved in relevant international developments.

An incident involving high numbers of trauma patients requiring blood transfusions would be combated by using reserve blood stocks in hospitals, making public appeals for blood donations and moving blood stocks around the country. A network of charities provides voluntary motorcycle couriers for NHS Blood and Transplant and NHS hospitals. They carry blue lights and sirens, which can be used when transporting blood or human tissue for transplant surgery.

Major trauma centres use mass-transfusion protocols to maximize blood products and administer them in the most effective manner.

Vaccines

The NHS Purchasing and Supply Agency in England makes and maintains contractual arrangements for the storage of antiviral stockpiles and for their distribution when authorized by the Chief Medical Officer.

4 Health Information

4.1 Information-management systems for risk-reduction and emergency-preparedness programmes

National risk register

The National Risk Assessment is a rolling programme, which aims to update the national risk register on an annual basis. Government departments may provide guidance on risks and assumptions derived from this programme in connection with emergency-response planning. Local risk-assessment and treatment plans are carried out by category-1 emergency responders listed under the Civil Contingencies Act. They collectively publish community-risk registers through local resilience forums (Fig. 5).

4.2 Information-management systems for emergency response and recovery

Internet web sites

The Government maintains and updates a wide range of web sites containing a huge amount of public information on current short- and long-term issues related to emergency response and recovery. Examples of these[14] are:

- Directgov (www.direct.gov.uk/en);

- Department of Health (www.dh.gov.uk/en);

- NHS (www.nhs.uk);

- Direct (www.nhsdirect.nhs.uk);

- Health Protection Agency (www.hpa.org.uk);

- National Travel Health Network and Centre (www.nathnac.org);

- Environment Agency (www.environment-agency.gov.uk);

- Department for Transport (http://dft.gov.uk);

- Met Office (www.metoffice.gov.uk).

Fig. 5. An illustration of the high-consequence risks facing the United Kingdom

Source: National risk register of civil emergencies. 2010 edition. London, Cabinet Office, 2010 (http://www.cabinetoffice.gov.uk/sites/default/files/resources/nationalriskregister 2010.pdf, accessed 15 April 2012) *(25).*

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14 The listed web sites were accessed 18 March 2012.

National resilience extranet

The national resilience extranet, which is under development, is a secure web-based browser tool that enables all category-1 and category-2 responders to access key information for multiagency work and communication. It can also be used by government departments and agencies and other key organizations in the United Kingdom resilience community to share knowledge and in connection with planning responses to emergency situations and managing incidents as they occur.[15]

Meteorological Office

The Meteorological Office for the United Kingdom aids in risk communication about extreme weather events, such as extreme cold or extreme heat, through cascading weather-related forecasts and bulletins. It also provides analyses of events, such as fires, and of related hazards, such as plumes and the airborne dispersal of contaminants.

4.3 Risk communication

General

The Risk and Regulation Advisory Council is an independent advisory group, which aims, by making and implementing policy, to improve the understanding of public risk and how best to respond to it.

The Interdepartmental Liaison Group on Risk Assessment has issued guidance on risk communication *(26)*.

The National Steering Committee on Warning & Informing the Public aims "to encourage improvements in the arrangements for warning members of the public of an imminent or actual threat to life, health or property and to inform them of the appropriate action to take". The four sub-groups of the committee relate to public education, new technology, media issues, and public address.

An example of the work of the steering committee is the "Go in, stay in, tune in" video, specifically designed for children of 7–11 years, the age group recognized by educational psychologists as being the most impressionable when it comes to learning safety lessons for life. Children in this age-group are also more prone to take their learning home.[16]

Directgov web site

On its web site, the Government provides information for the public on preparing for emergencies.[17]

In response to a crisis, public relations departments at the national, regional and local levels will facilitate interaction with the media, communicate information to the public and answer questions raised.

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15 Further information on the National Resilience Extranet available at: www.cabinetoffice.gov.uk/content/national-resilience-extranet, accessed on 18 March 2012.

16 Further information on National Steering Committee on Warning and Informing the Public available at: www.cabinetoffice.gov.uk/content/national-steering-committee-warning-informing-public-nscwip, accessed 18 March 2012.

17 Further information on preparing for emergencies available at: www.direct.gov.uk/en/HomeAndCommunity/InYourHome/Dealingwithemergencies/Preparingforemergencies/index.htm, accessed 18 March 2012.

The British Broadcasting Corporation

The British Broadcasting Corporation (BBC) operates 6 national and 40 local radio stations, 54 local web sites and 15 national and regional TV news programmes. Traditionally, it has been the role of the BBC to provide emergency broadcasts to the public. However, both public and commercial broadcasters are likely to assist if requested to do so by the Government. The BBC national/local radio network has a carefully designed resilience plan to ensure that it can stay on the air during a crisis to provide the vital information local communities will need. *(27)*

Online risk communication for health is provided on the web site of the Department of Health. One example is the Winterwatch bulletin, which provides regular updates on how the NHS is coping with increased demands on its services in the cold winter months, as well as practical advice on keeping well in very cold weather. The site includes links to key data and statistics and is updated regularly. *(28)*

Case study 2. Flooding

Source: Health Protection Agency.

The floods of 2007 were the worst ever recorded in the United Kingdom and their impact on health was wide ranging. The combined rainfall of 24–25 June and 19–20 July 2007 in England and Wales was unprecedented; the affected areas registered over three times as much rain as the average for the same period in 2006. Exceptional flooding occurred in many regions: South Yorkshire and Hull were worst affected in June 2007, followed by Worcestershire, Gloucestershire and the Thames Valley in July. The events were characterized by both fluvial (riverine) and pluvial (caused by rainfall on water-logged ground) flooding. The following information summarizes the main impact of the 2007 floods. *(29)*

- 55 000 properties were flooded *(29)*.

- 7000 people were rescued from the flood waters by emergency services *(30)*.

- 13 people died *(29)*.

- 400 000 pupil school days were lost due to school closures *(31)*.

- In July, 350 000 people were without water supply for 17 days *(30)*.

- In July, 42 000 people were without electricity for up to 24 hours *(30)*.

- In July, 10 000 people were trapped on the M5 motorway, and 500 people were stranded at Gloucester railway station during the incident *(30)*.

- In July, care homes and hospitals were among the first to be evacuated *(30)*.

- The economic cost of the flooding (health and social costs excluded) was estimated at £40 billion, based on infrastructure damage *(30)*.

Although flooding is usually a local emergency, the scale of the 2007 floods was such that regional and national efforts were integral to the response.

The urgency of the loss of drinking water in Gloucestershire resulted in the involvement of the Gloucestershire Gold Command and the Cabinet Office Briefing Rooms in logistics' sourcing and distribution. In response to the loss of mains water, Severn Trent Water – assisted by the Armed Forces – provided each person affected with a minimum of 10 litres of water per day (as required by the Security and Emergency Measures Direction) via bowsers, tankers and bottled water; most people received more than this amount. The amount of water provided proved to be insufficient for the long period of up to 17 days.

The Fire and Rescue Service carried out a large proportion of the search and rescue operations; other agencies involved included the Armed Forces, the Maritime and Coastguard Agency, the Royal National Lifeboat Institution, Rapid UK, the Severn Area Rescue Association, Somerset and Avon Search and Rescue, and the Royal Society for the Prevention of Cruelty to Animals. Uncertainty about coordination of effort and the command structure were noted in a review of the emergency response.

Numerous voluntary organizations also played a key role in the response effort, including the British Red Cross and the Salvation Army. *(29)*

5 Health Financing

5.1 National and subnational strategies for financing heath-sector emergency management

Contingency funding is accessible at all levels of government.

Health Protection Agency funding in case of disaster

The Health Protection Agency is funded by the Department of Health, which is the Agency's sponsoring body. The Agency's budget is expected to include funding for emergency preparedness and response as part of the Agency's core health-protection business. In the event of a major national emergency, the Agency would liaise with the Department of Health on reimbursement of any additional costs, if appropriate.

The Bellwin Scheme

The Bellwin Scheme of emergency financial assistance to local authorities is named after the late Lord Bellwin, a minister in the former Department of the Environment, who introduced the scheme in 1983. It was given a statutory basis in Section 155 of the Local Government and Housing Act 1989. *(32)*

The Bellwin Scheme may be activated in the case of an emergency or disaster that involves the destruction of, or danger to, life or property and results in one or more local authorities incurring expenditure on, or in connection with, taking immediate action to safeguard life or property or to prevent suffering or severe inconvenience in their area(s). There is no automatic entitlement to financial assistance; ministers are empowered by Section 155 of the Local Government and Housing Act 1989 to decide, in each case, whether or not to activate the scheme.

The guidance notes and threshold information of the Bellwin Scheme set out the terms under which the Department for Communities and Local Government in England is prepared to make emergency financial assistance available to the local authorities (as defined in Section 155(4) of the Local Government and Housing Act 1989).

6 Service delivery

6.1 Response capacity and capability

Health-sector emergency-response plans

All category-1 responder organizations in England have a major-incident plan with supporting event-specific plans. The latter have been developed in partnership with appropriate stakeholders.

NHS issued emergency-planning guidance in 2005, which describes the general principles that guide all NHS organizations in developing their ability to respond to a major incident and manage recovery operations, whether the effects of the incident are local, regional or national, according to the requirements of the Civil Contingencies Act 2004.

6.2 Emergency-medical-services system and mass-casualty management

Emergency medical services are provided through local NHS ambulance services, known in England as ambulance trusts. There are ten ambulance trusts with boundaries that are generally in line with those of the regional government offices. Their performance is measured against criteria set by the Department of Health. The target for ambulances is a 75% success rate in responding to category-A (life threatening) calls so that they reach their destination within eight minutes, as recorded by the computerized dispatch system. Ambulances are dispatched through computer-aided dispatch systems within emergency operations centres. Ambulance trusts have systems in place for increasing the numbers of dispatchers and responders if faced with an increase in workload.

Hazardous area response teams

Hazardous area response teams (HART) are specially recruited and trained personnel who provide the ambulance response to major incidents (of accidental or deliberate cause) that involve hazardous materials or take place in hazardous environments.

HART work alongside the fire and rescue services within the inner cordon (or "hot zone") of a major incident. Their primary role is to triage and treat casualties and save lives in very difficult circumstances (e.g. where there is a danger of explosions, the collapse of a building, chemical incidents or incidents involving firearms). They also take care of other emergency personnel who may become injured in the course of duty during the incidents.

Charity-funded ambulances

The main voluntary ambulance providers in England are the British Red Cross and St. John Ambulance, which have been providing emergency medical cover in the United Kingdom for many years, also during both World Wars. Agreements (memoranda of understanding) drawn up between

the voluntary ambulance providers and the local ambulance trust may include a provision allowing the former to treat patients and transport them to hospital and/or provide the ambulance trust with reserve cover, the service most often required during major incidents.

The British Association for Immediate Care (BASICS)[18] provides doctors trained in prehospital emergency medicine. These may assist ambulance paramedics at the scenes of serious road accidents and in connection with severe illness and mass-casualty incidents.

Helicopter emergency medical system

In England and Wales, 24 helicopters, funded by charities, operate under the Civil Aviation Authority Helicopter Emergency Medical System. They are able to land in unplanned helicopter landing sites to deliver life-saving medical care and transport critically ill patients to hospital. Some helicopters are staffed by paramedics while others have teams comprising paramedics and doctors. The ability to deliver highly trained medical teams to move patients over large distances is clearly beneficial in major incidents.

Search and rescue

Search and rescue facilities include:

- police, fire and ambulance services;
- the Coastguard Rescue Service (comprising 362 teams strategically placed around the coast);
- mountain and cave rescue teams;
- search and rescue helicopters contracted by the Maritime and Coastguard Agency;
- lifeboats operated by the Royal National Lifeboat Institution;
- search and rescue helicopters operated by the Royal Navy and the Royal Air Force;
- nominated beach lifeguard units of the Royal National Lifeboat Institution and others.

The Coastguard Rescue Service
The British Government has delegated responsibility for civilian maritime search and rescue to Her Majesty's Coastguard (the Coastguard), which is part of the Maritime and Coastguard Agency. The Coastguard has its own volunteer service, the Coastguard Rescue Service, consisting of teams of volunteers who can respond to land-based emergencies, such as cliff and mud rescues.

A network of 19 maritime rescue coordination centres responds to reports of maritime and coastal distress. Distress calls can come in through the monitored emergency radio frequencies, or through the 999 emergency system. As the Coastguard is a recognized emergency service, it can call upon a wide variety of resources when coordinating search and rescue.

Mountain and cave rescue services
Mountain and cave rescues in the United Kingdom are the responsibility of the police, as part of their obligation to "protect life and property". However, in England, the actual delivery of services to this end is provided via the Mountain Rescue Council of England and Wales, the national voluntary coordinating body for mountain rescue in England and Wales. The Mountain Rescue Council of England and Wales works alongside the British Cave Rescue Council, the Search and Rescue Dog Association, the Association of Chief Police Officers, the Coastguard Rescue Service, RAF Search and Rescue, the Fire Service Inspectorate, the Sports Council and the Ambulance Service Chief Executives Group. Together they strive to ensure the proper use of teams, not only for traditional

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18 Further information on BASICS available at: www.basics.org.uk, accessed 19 March 2012.

search and rescue missions, but also as a support to the other blue-light services as required (e.g. widespread, severe winter-weather conditions).[19]

Mountain and cave rescue teams, as well as the Search and Rescue Dog Association, are called out through the 999 system, and work with the police, ambulance or fire service, according to the nature of the incident. They frequently work with RAF Search and Rescue and, increasingly, with the various air ambulances. Incidents on sea cliffs are coordinated by the Coastguard Rescue Service although in some areas joint arrangements are in place.

Medical emergency response and intervention teams

Medical emergency response and incident teams (MERIT) comprise doctors, nurses and paramedics specially trained in prehospital emergency medicine and major-incident medical management. They are employed to provide, for example, analgesia or specialist services for children at the scene of a major incident, Ideally, the members of these teams should not be provided by the hospital receiving acute cases (so as not to deprive the hospital of key staff).

Mass-fatality plan and management of the deceased

Mass-fatality plan
Each region has a mass-fatality plan aimed at:

- providing an integrated emergency response to a mass-fatality incident;

- providing options for dealing with incidents involving large numbers of human fatalities;

- acting as a signposting document for other agencies and for formulating detailed plans.

A mass-fatality plan may also be used in response to an incident occurring overseas, which calls for the identification and repatriation of large numbers of United Kingdom nationals.

Managing the deceased
A coroner is a government official who investigates human death and has the ultimate responsibility for establishing the identity of the deceased and the cause and time of death. During an incident, the coroner appointed may wish to view the human remains in situ, prior to recovery. In a multiscene incident, involving a number of coroners, consideration is given to the appointment of a lead coroner by recorded agreement.

Coroners are assisted in their efforts by Home Office pathologists who, in turn, are assisted by forensic scientists of many disciplines. The pathologists (assisted by the forensic scientists) provide post-mortem information, such as the identity of the deceased and cause of death (police officers make enquiries on their behalf). A pathologist may wish to view the human remains in situ, prior to recovery.

The police gold commander appoints a senior identification manager who, in consultation with the senior investigation officer, will determine the terms of reference. The senior identification manager will normally assume responsibility for the key areas of the identification process, which include the casualty bureau, family liaison, disaster-victim recovery, identification teams and mortuary teams.

In the event of a disaster, a scene evidence recovery manager (SERM) is appointed to provide a single point of contact at the scene. SERM reports to the senior identification manager regarding the recovery of human remains and to the senior investigation officer with evidence resulting from technical and physical investigations at the scene of the incident. SERM also chairs and provides minutes of meetings of the SERM group, comprising relevant multiagency and specialist advisors

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19 Further information on mountain rescue in England and Wales available at: www.mountain.rescue.org.uk/organization, accessed 19 March 2012.

assisting in the recovery programme. Some of these will have the statutory power to conduct investigations (e.g. the United Kingdom Air Accidents Investigation Branch and the Rail Accident Investigation Branch); others (e.g. operators of gear for heavy lifting or deconstruction engineers) will be able to provide technical assistance and advice. Representatives of the private industry (e.g. transportation operators and site owners) are also included in the group.

Disaster-victim recovery and identification teams are set up, comprising specially trained officers. The teams are deployed by the senior identification manager, in consultation with the coroner and the pathologist, to recover the deceased in a respectful and dignified manner, in accordance with SERM requirements and a nationally agreed standard. Information is recorded using the Association of Chief Police Officers (ACPO) victim label booklet, which provides for continuity of evidence relating to the movement and storage of the deceased.

Mortuaries
Local authorities have a duty to provide mortuary facilities. These can be divided into two main types: designated local mortuary facilities; and emergency mortuary facilities.

If the designated mortuaries are overrun or unable to cope adequately with the incident, the coroner, pathologist and senior identification manager may request the local authority to provide additional emergency mortuary facilities. The national emergency mortuary plan of the Home Office helps drive the decision-making and implementation processes. All mortuaries must be licensed by the Human Tissue Authority. *(33)*

6.3 Management of hospitals in mass-casualty incidents

Regional trauma networks

A report by the National Audit Office in 2010 supported the view that trauma care in England should be augmented by introducing a small network of regional trauma hospitals, led by the health authorities, integrating prehospital care (i.e. the care delivered by paramedics at the scene of the injury), patient transfer to a suitable unit, interhospital transfer (for patients in need of specialist treatment), and definitive hospital treatment and rehabilitation *(34)*.

The report also suggested pursuing the recommendations on trauma management resulting from the National Confidential Enquiry into Patient Outcome and Death *(35)*.

1. Ambulance trusts and emergency departments should have clear guidelines on pre-alerts in connection with the severely injured (i.e. an emergency call from an ambulance to a receiving department regarding the imminent arrival of a patient requiring a specific resource).

2. Trusts should ensure the existence of a fully staffed emergency department and the availability of a trauma team 24 hours a day, 7 days a week.

3. The leader of the team managing severely injured patients must be a doctor at consultant level (i.e. a fully trained specialist). If this is not possible, the patient's condition must be reviewed by a person of this standing within 12 hours of arrival at the hospital.

4. All major surgical specialties (orthopaedic trauma, general and vascular surgery, neurosurgery, plastic surgery, cardiothoracic surgery, head and neck surgery, urology), as well as interventional radiology and anaesthesiology should be represented at a single site and there should be appropriate intensive-care facilities.

Each region now has a major trauma plan, which defines the pathway of care for severely injured patients, identifies the location and capability of each trust/hospital within the trauma system, and outlines ambulance bypass protocols and thresholds for transferring patients to specialized units.

The provision of dedicated major trauma centres has consistently been shown to improve patient survival and to reduce the length of admissions. Therefore, selected hospitals across England have been designated as such. To qualify as a major trauma centre, a unit must be able meet the criteria outlined in points 2–4 above.

National burns networks

In April 2011, the Department of Health published revised national guidance on planning for a major incident resulting in a significant number of severe burn casualties *(36).* Specialized burn services in England are geographically organized in four networks.

The national guidance recognizes that an incident involving critically injured burn patients could exceed the capacity of any individual service or network and, therefore, plans for the effective escalation of and access to mutual aid. It recommends that burn-care networks have agreed major-incident plans in place at the local level, which describe the normal and surge capacity of each burn service, escalation procedures, and the way in which expert advice on burn care will be made available to the NHS major-incident command and control to ensure optimal utilization of specialized burn capacity.

Hospital response to major incidents

The Civil Contingencies Act of 2004 requires that all hospitals with emergency departments be category-1 responders, enhancing NHS' capability of working as part of a multiagency response. This means that, in responding to major incidents on any scale, NHS will be able to deliver optimum care and assistance to victims, minimize the consequential disruption to health-care services, and bring about a speedy return to normal levels of functioning.

Local hospital plans for major-incident response must provide for:

- transfer or discharge of non-critical patients from the emergency department;
- mobilization of additional staff, as required;
- sufficient stocks supplies for the emergency department;
- surge capacity required by laboratories for testing samples;
- planning for chemical, biological radiological and nuclear (CBRN) incidents: and
- training of all emergency-department personnel in major-incident management.

The decision to implement the plan is made by the senior doctor and senior nurse present in the emergency department, following discussion with the on-call executive director, if necessary. The switchboard personnel are instructed to commence the procedure of notifying key personnel, which will activate further cascade systems across the hospital.

Once a major incident has been declared, the hospital trust receiving casualties operates a hospital command-and-control structure similar to that used by central-government:

- gold command (strategic decision-making and recovery phase);
- silver command (tactical decision-making by the hospital control and coordination team);
- bronze command (operational decision-making based on the hospital departments involved).

Case study 3: London transport bombings, 7 July 2005

On 7 July 2005 (often referred to as 7/7), a series of coordinated suicide attacks targeted civilians using London's public transport system during the morning rush hour. Three bombs were detonated in quick succession aboard London underground trains across the city; later, a fourth bomb was detonated on a double-decker bus in Tavistock Square. Fifty-four people, as well as the four bombers, were killed in the attacks and over 700 more were injured. Approximately 350 people were treated at the scenes of the attacks and 350 were transported to hospital.

Initially, all emergency departments in London were put on major-incident standby by gold command. Twelve inner-London hospitals instituted their major-incident plans and casualties were distributed among six London university hospitals on the basis of their proximity to the incidents and their capacity and capability.

The London Ambulance Service's major-incident plan relies on the triage sieve algorithm and is designed to distinguish between; the dead; priority 1 (immediate); priority 2 (urgent); and priority 3 (walking wounded). On the arrival of further resources, patients can be subject to a more refined triage (known as triage sort) either in situ or after they have been moved to a place of safety, such as a casualty clearing station. Triage sort is based on respiratory rate, systolic blood pressure and the Glasgow Coma Scale.

The London Air Ambulance usually has one team on duty comprising a physician and a paramedic specialized in trauma. By chance, on the morning of the bombings, the London Air Ambulance was holding a clinical governance day, which made it possible to second and deploy a total of 27 teams across the four bomb scenes. The bus explosion occurred outside the building, which houses the British Medical Association, and many doctors (ranging from general practitioners to highly specialized surgeons) ran out to aid the victims.

In her Coroner's inquest, Lady Justice Hallet recommended that the London Ambulance Service and the London Air Ambulance review existing training in multicasualty triage. In addition, guidance issued by the Department of Health now requires the provision of medical emergency response incident teams (MERIT) across the country.

The emergency services were inhibited by the high volume of radio and mobile-phone communication, which caused congestion of the telecommunication airwaves, and by restrictions on the coverage of their radio systems. The emergency services now use the AIRWAVE digital radio system to improve the coverage, capacity and clarity of interagency communication. *(37)*

Private hospitals and organizations

The special provision for private support to NHS is a verbal understanding only. All NHS organizations are encouraged to engage with their local private providers to ensure that they are included and engaged in the emergency response, and to set up memoranda of understanding where needed.

6.4 Continuity of essential health programmes and services

The business continuity standard, BS 25999

BS 25999 was developed by the British Standards Institution to help minimize disruption to normal business operations, regardless of whether this is caused by minor, frequent interruptions or by

major natural disasters and acts of terrorism. The necessity to minimize disruption to business was backed by the Civil Contingencies Act, which was passed in 2004 to ensure government preparedness to respond to emergencies. For example, in responding to the Buncefield oil storage depot fire in 2005 (Case study 1), business continuity was put high on the agenda.

Since the aim of introducing BS 25999 was to move the focus away from the information technology of an organization to its entire business operations, the standard has built up a broad following not only in the United Kingdom but also throughout the world. Many organizations in different sectors of industry and at various geographical locations have implemented it. The concept of business continuity applies not only to commercial organizations but also to health-care organizations where, as far as possible, patient care should not be compromised because of external events. For example, while elective surgery in hospital can safely be postponed in the face of an incident involving mass trauma, other emergency operations, such as caesarean sections, must be carried out despite the increased workload. In addition, health-care organizations must be ready to resume their normal functions as soon as possible after a major incident.

Recovery (chemical incidents)

Recovery is defined as the process of rebuilding, restoring and rehabilitating the community following an emergency. It is more than simply the replacement of what has been destroyed and the rehabilitation of those affected.

In the case of a chemical incident, although the scientific knowledge surrounding the response to the acute phase is extensive, there is limited information available in relation to the recovery phase.

The response to a major chemical incident in the United Kingdom would involve numerous government departments and agencies, public services and other bodies. It would require appropriate decision-making with respect to the selection of relevant recovery and remediation options, taking into account a variety of factors that may influence this selection (e.g. affected area and local population).

The Health Protection Agency, in collaboration with the Department for Environment, Food and Rural Affairs, the Food Standards Agency, the Home Office, the Northern Ireland Environment Agency and the Government of Scotland, is developing a United Kingdom recovery handbook for chemical incidents. The handbook will be a user-friendly tool to aid the decision-making process related to the implementation of a recovery strategy in the aftermath of a chemical incident and management of the many facets of such an incident. It is aimed at national and local authorities, central-government departments and agencies, environmental and health-protection experts, emergency services, industry and others who may be affected by a chemical incident.

Prevention and control of communicable diseases and immunization

The Health Protection Agency provides syndromic surveillance across the United Kingdom by collating data from health-care providers, such as emergency departments and general practitioners. It also researches new outbreaks of disease, provides advice to the Government and NHS trusts on appropriate responses to those diseases, and communicates thereon with international organizations, such as WHO.

6.5 Logistic and operational support functions in emergencies

Telecommunications

There is a wide range of secure, multiagency telecommunications systems in use in England. These include: landline; cell phone; radio and satellite communications; the Internet, intranet and mobile email; and telephone and video conferencing.

Following the London bombings of 7 July 2005 (Case study 3), many category-1 responders have now purchased satellite communications equipment to ensure the availability of robust systems during an emergency.

Common access number (999)

For the public, the first point of contact with the emergency services is usually made by dialling "999" from any landline or cell phone. The call will be directed to the appropriate emergency service.

Service-delivery support

Hospitals have arrangements in place for dealing with security threats to staff and premises and for providing crowd control during major incidents.

Recommendations

With a view to enhancing the preparedness of the English health system for crises, the Department of Health may consider taking action to:

1. establish an accessible repository of material relating to all major incidents in England (reports, enquiries, publications, etc.) to enhance learning and broaden the evidence base;

2. introduce a standardized structure for reporting major incidents, related exercises and lessons learnt, and include the reports in the aforementioned repository of material;

3. ensure, in view of the rapidly changing topography of the health service, the maintenance and strengthening of corporate knowledge and interorganizational collaboration, as well as the maintenance of effective multiagency command and control arrangements;

4. establish national and international agreements (memoranda of understanding) with regard to the provision of resources required in an incident response, including beds for critical care (adult, paediatric, burns and neurosurgical cases), transportation, equipment and expertise;

5. set up agreements (using memoranda of understanding) on sharing relevant information, technical knowledge and good practice and on strengthening response systems and alerting mechanisms;

6. enhance understanding and awareness of IHR at all response levels of the health system in England;

7. inventorize emergency airway and ventilation equipment to ensure sufficient availability in the event of a mass-casualty incident;

8. standardize equipment across ambulance trusts on the basis of existing national training standards;

9. establish a professional register of health-care emergency planners;

10. ensure that all trusts have identified emergency planners that are trained, competent and well-resourced;

11. develop a national template to standardize health organizations' emergency plans (and the terminology used) to ensure interoperability of responses and facilitate a consistent and integrated approach to training, exercises and audits;

12. clearly define the term, "gold commander" and standardize its use across the health system;

13. repeat this assessment in two years' time (2013).

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Annexes

Annex 1. Summary of core literature relating to crisis management

The importance of coordinating planning and service-delivery activities among local authorities, disaster-response organizations, and governmental agencies, is vital to minimize duplication and enable appropriate referral procedures *(1)*. "Never has public health been more political or the linkages with government stronger or more demanding" *(2)*, due to the inherently political nature of disaster decision-making, such as the allocation of resources. A tiered system for the allocation of resources, upgraded according to requirements, is optimal *(3)*.

Efficient disaster management requires multiagency partnership agreements to redress the often inadequate planning in relation to communication, organizational structure, acquisition of supplies, and availability of suitably trained health-care providers and volunteers *(4)*.

The vulnerability of communities in the face of disaster results from "social and personal factors … confounded by system, policy and institutional factors" *(5)*. Individual health departments face multiple challenges in the face of all-hazards disasters *(6)*. In the publication, *Hospitals safe from disasters*, WHO recognises that "making hospitals and health facilities safe from disasters is an economic requirement, and also a social, moral and ethical necessity" *(7)*. It is argued that by integrating local health-disaster management with cross-sector community preparedness, conventional threats can be met with more resilience *(8)*. Communities need the support provided by a health-system approach, enabling the comprehensive planning of emergency operations and established response capabilities with integrated surveillance and notification systems for identifying and communicating emergencies *(9)*.

The response of any individual country to disaster is strongly determined by its constitutional, legal and social framework *(10)*. A national disaster-response structure needs to be transparent, consistent across jurisdictions, and conducive to the efficient functioning of the health system in the event of a disaster *(11)*.

Universal access to health care facilitates the earlier detection of new diseases, better enables disease control and surveillance, and minimizes detriment to population health caused by delayed care. In times of crisis, issues relating to payment systems become acute, affect access to medications *(12)* and make it more complex to defer elective procedures and discharge patients to make space for those who are severely ill *(13)*. Alternative payment systems can lead to inequality, complicating health access for those with low incomes *(14)*. Inadequate access to health care due to fragmented health systems poses a threat to national security. It has been argued that limiting access to health care in the face of today's threats is morally and politically unacceptable *(15)*.

Legal governance in disaster management is important: "at every level of government, laws determine what constitutes a public health emergency, disaster, or general emergency. Laws help create the infrastructure through which emergencies are detected, prevented, declared, and addressed" *(16)*. For example, Parker explains the need for clear legislation to allow hospitals and intensive care units to adjust standards of care when overwhelmed by a disaster *(17)*. Thus, a system-wide, integrated approach to disaster management is required to provide a "robust infrastructure that has reserve capacities beyond routine functioning" *(18)*.

Cooperation and coordination is needed for threat assessment and planning at the international level. To meet this objective, the International Health Regulations require States Parties to

notify WHO of any event of potential international public health concern *(19)*. Cross-boundary infrastructure for infectious disease and public health response is required, including formalizing a network of appropriately resourced laboratories *(20)*. Jones contributes a checklist of organizational agreements and structures to help foster cross-border public health preparedness, observing that "public health preparedness represents not the sum of region-level preparedness, but also the capacity to collaborate across regional and international borders during a public health emergency" *(21)*. System-wide structures need to be in place to allow for such regional coordination.

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Annex 2. Members of the assessment team

Chelsea and Westminster Hospital NHS Foundation Trust, London

Ms Melanie Van Limborgh
Head of Quality and Assurance

Dorset County Hospital NHS Foundation Trust, Dorchester

Mr Craig Brown
Assistant Director for Resilience and Olympic Preparation

Health Protection Agency, London

Professor David Baker
Consultant Medical Toxicologist, Extreme Events and Health Protection

Dr Sarah Finlay
Registrar in Emergency Medicine on attachment to Extreme Events and Health Protection

Mr Kevin Manley
Specialist Environmental Public Health Scientist, Environmental Hazards and Emergencies

Ms Gaynor Marshall
Supra Regional Emergency Preparedness Manager

Dr Brian McCloskey
Regional Director, London, Health Protection Services

Professor Virginia Murray
Head, Extreme Events and Health Protection

Ms Aya Osman
Environmental Public Health Scientist, Extreme Events and Health Protection

Mr Paul Riley
Head of Exercises and Events, Emergency Response Department

Dr John Simpson
Deputy Director, Emergency Response and Head of Emergency Response Department

Dr Lee Soomaroo
Registrar in Emergency Medicine on attachment to Extreme Events and Health Protection

Ms Carla Stanke
Environmental Public Health Scientist, Extreme Events and Health Protection

Dr Chris Wright
Consultant in Emergency Medicine on attachment to Extreme Events and Health Protection

NHS London Strategic Health Authority

Mr Peter Boorman
Emergency Preparedness Network Manager

The Royal College of Surgeons of Edinburgh

Mr David Whitmore
Member of the Faculty of Pre-Hospital Care

WHO Regional Office for Europe

Dr Gerald Rockenschaub
Programme Manager
Country Emergency Preparedness

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Annex 4. Persons interviewed during the assessment

London

Armed Forces

Lt Col Richard Clements
Armed Forces Liaison Officer

Cabinet Office

Dr Stuart Wainwright
Assistant Director for Health and Environment

Department of Health

Dr Hilary Walker
Deputy Director for Emergency Planning, Resilience and Response

Emergency Planning Society

Mr Mark Beveridge
Chair

Health Protection Agency

Professor David Baker
Consultant Medical Toxicologist, Extreme Events and Health Protection,

Ms Mary Morrey
Deputy Director
Centre for Radiation Chemicals and Environment,

Mr John Simpson
Head, Emergency Planning

Dr Brian McCloskey
Planning Lead for 2012 Olympics and Paralympics

National Health Service

Mr Andy Wapling
Head, Emergency Preparedness

Annex 5. Members of the writing team

Principal author

Dr Chris Wright

Consultant in Emergency Medicine on attachment to Extreme Events and Health Protection
Health Protection Agency, London

Contributing authors

Dr Claire Bayntun
Registrar in Public Health on attachment to Extreme Events and Health Protection
Health Protection Agency, London

Dr Sarah Finlay
Registrar in Emergency Medicine on attachment to Extreme Events and Health Protection
Health Protection Agency, London

Dr Brian McCloskey
Regional Director, London, Health Protection Services
Health Protection Agency, London

Professor Virginia Murray
Head, Extreme Events and Health Protection
Health Protection Agency, London

Ms Aya Osman
Environmental Public Health Scientist, Extreme Events and Health Protection
Health Protection Agency, London

Dr Gerald Rockenschaub
Programme Manager
Country Emergency Preparedness

Dr John Simpson
Deputy Director, Emergency Response and
Head of Emergency Response Department
Health Protection Agency, London

Dr Lee Soomaroo
Registrar in Emergency Medicine on attachment to Extreme Events and Health Protection
Health Protection Agency, London

Ms Carla Stanke
Environmental Public Health Scientist, Extreme Events and Health Protection
Health Protection Agency, London

"New diseases are global threats to health that
also cause shocks to economies and societies.
Defence against these threats enhances our
collective security. Communities also need health
security. This means provision of the fundamental
prerequisites for health: enough food, safe water,
shelter, and access to essential health care and
medicines. These essential needs must also be
met when emergencies or disasters occur."

– Dr Margaret Chan
   WHO Director-General