Public Health England and the Sendai Framework for Disaster Risk Reduction 2015-2030

A review

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health, and are a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS in a professionally independent manner.

Public Health England
Wellington House
133-155 Waterloo Road
London SE1 8UG
Tel: 020 7654 8000
www.gov.uk/phe
Twitter: @PHE_uk
Facebook: www.facebook.com/PublicHealthEngland

Prepared by: Kevin Blanchard, Rishma Maini, Lorcan Clarke and Prof. Virginia Murray. For queries relating to this document, please contact: Prof. Virginia Murray or Kevin Blanchard

Published July 2017
PHE publications
gateway number: 201306

PHE supports the UN Sustainable Development Goals:

Corporate member of
Plain English Campaign
Committed to clearer
communication
339

Contents

Executive summary & acknowledgements

Background

Public Health England (PHE) is an executive agency of the UK government's Department of Health and works across government at all levels. It is a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS (National Health Service) in a professionally independent manner.

PHE's mission is to protect the nation from public health hazards, prepare for and respond to public health emergencies, improve the health of the whole population by sharing its information and expertise, identify and prepare for future public health challenges and research, collect and analyse data to improve understanding of public health challenges, and develop solutions to public health problems. PHE achieves this through world-class science, knowledge and intelligence, advocacy, partnerships and providing specialist public health services. Alongside the UK's NHS, PHE supports the public to make choices which improve their health and wellbeing.

PHE employs 5,500 staff (full-time equivalent), mostly scientists, researchers and public health professionals. It works in 8 local centres, plus an integrated region and centre for London, and 4 regions (north of England, south of England, Midlands and east of England, and London). It also works closely with public health professionals in Wales, Scotland and Northern Ireland.

PHE not only works at a national level but is also influential globally. It supports the implementation of international agreements relating to public health, including: the International Health Regulations, Sustainable Development Goals, the Paris Agreement, and the Sendai Framework for Disaster Risk Reduction.

The Sendai Framework for Disaster Risk Reduction 2015-2030

The Sendai Framework for Disaster Risk Reduction 2015-2030 is a voluntary United Nations (UN) agreement endorsed by the UN General Assembly in June 2015. It is one of three landmark agreements of the post-2015 development agenda, which includes the Sustainable Development Goals and Paris Climate Agreement. The Sendai Framework offers governments the opportunity to enhance their disaster risk reduction capacities, by ensuring a role for multi-hazard management of disaster risk in all countries, at all scales and across all sectors.

The Sendai Framework outlines 7 clear targets and 4 priorities for action to prevent new and reduce existing disaster risks, namely:

- Priority 1: Understanding disaster risk.
- Priority 2: Strengthening disaster risk governance to manage disaster risk.
- Priority 3: Investing in disaster risk reduction for resilience.
- Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.

The UK's progress on disaster risk reduction

Historically, the UK has participated in several reviews over recent years related to disaster risk reduction and emergency preparedness.

The UK was the first country to undergo a peer review of its progress in monitoring the implementation of the Hyogo Framework for Action 2005-2015 (HFA), which was the predecessor of the Sendai Framework. This report identified good practices and areas for improvement, and made recommendations to achieve further progress. However, the HFA centered more on responses to disasters, while the Sendai Framework builds on the HFA in that it also focusses on reducing disaster risks.

In 2011, the WHO (World Health Organization) assessed the status of England's health system's preparedness and in 2015, the UK was one of five countries to undergo a Global Health Security Assessment pilot assessment. The UK, amongst other countries, has also contributed to the development of a new Strategic Framework for Emergency Preparedness coordinated by the WHO.

A recent report published by the UN Secretary General on the implementation of the Sendai Framework, has indicated that member states have made significant progress in reducing disaster risk, but that enormous challenges remain. With the economic costs of disasters continuing to escalate and climate change acting as a "force multiplier", disaster risk reduction is critical to ensuring that public and private investments in development are resilient to human and man-made hazards.

This review is the first assessment of how PHE contributes to the implementation of the Sendai Framework as PHE works to promote world-class science and evidence into action.

Aim

The aim of this review is to assess PHE's activities and contribution to England's performance against the Sendai Framework for Disaster Risk Reduction, providing an overview of progress to date.

Methods

A half day workshop facilitated by members of the Global Disaster Risk Reduction (GDRR) team at PHE was held on 3 February 2017 with senior staff from a range of different departments within PHE.

Workshop participants were asked to read through each of the paragraphs of the 4 priorities for action identified in the Sendai Framework and provide examples of:

- PHE local and national work areas already being implemented which are aligned with the Sendai Framework
- PHE international work areas already being implemented which are aligned with the Sendai Framework
- research being undertaken by PHE to support implementation of the Sendai Framework both nationally and internationally

This workshop mapped several projects and workstreams to the Sendai Framework priorities for action. It was then followed-up by a series of one to one meetings and targeted e-mail correspondence with senior members of departments within PHE who had not been able to attend the workshop. A draft of the findings was then shared for comment with all those who had participated to ensure, as far as possible, completeness and accuracy of the data collected.

Results

The Sendai Framework fits with a number of PHE's objectives both through its annual business plan and its wider strategic plan until 2020. This review has identified that as part of its core business, PHE undertakes a wide range of activities which are already consistent with the Sendai Framework priorities. It also indicates that PHE conducts several projects which go beyond core business and are aligned with the Framework. Given the depth and range of information collected, it is intended that more complete and detailed findings of the review will be made available through an interactive online tool to allow easier usability and updating over the next year.

Reflecting the actions identified in the Sendai Framework, examples of PHE's expertise and knowledge provided across the UK government at local and national, regional and global levels, are shared below:

Locally and nationally

PHE is a Category 1 Responder under the Civil Contingencies Act (2004). The Civil Contingencies Act delivers a single framework for civil protection in the UK and is regarded as an important system for directing and facilitating emergency planning in England, forming the legal basis of PHE's National Incident and Emergency Response

Plan. Category 1 organisations are at the core of the response to most emergencies. The work in PHE is led by the corporate resilience team which is responsible for Emergency Preparedness, Resilience and Response (EPRR) functions at the national level. PHE is able to work effectively across government with partners such as the Cabinet Office's Civil Contingencies Secretariat from the local to national levels, to comply with the Civil Contingencies Act.

PHE provides support for the National Risk Register of Civil Emergencies. This register provides an updated government assessment of the likelihood and potential impact of a range of different civil emergency risks (including naturally and accidentally occurring hazards and malicious threats) that may directly affect the UK over the next five years. It also provides information on how the UK government and local respondents such as emergency services prepare for these emergencies.

The first deadline for the Sendai Framework is to have national and local disaster risk reduction strategies in place by 2020. England has already made great progress on this, for example, through the establishment of the Extreme Events and Health Protection team that have developed and implemented extreme weather plans for heat and cold events. The threat from pandemic flu remains the top national risk and the Pandemic Influenza Response Plan details PHE's roles and responsibilities during the preparation for and response to a pandemic.

Regionally and globally

PHE houses the WHO Collaborating Centre on Mass Gatherings and Global Health Security. Part of its role is to provide support to the emergency and health protection preparedness programmes, strategies and policies of PHE and the WHO at national, regional and global level, focusing on high visibility-high consequence events (including mass gatherings such as the London 2012 Summer Olympics) and areas where cross-government working is critical in the UK and more widely.

The UK Public Health Rapid Support Team managed within the Global Public Health Division, consists of clinicians, scientists and academics linked to the London School of Hygeiene and Tropical Medicine, who can be deployed to tackle outbreaks of disease anywhere in the world within 48 hours. They are on call to respond to urgent requests from countries around the world and fly in to help tackle disease outbreaks at source.

PHE has a Global Disaster Risk Reduction (GDRR) team within its Global Public Health Division of the Health Protection/ Medical Directorate. This team contributes to knowledge transfer to facilitate implementation of the Sendai Framework. Recently, it has supported the United Nations Office for Disaster Risk Reduction (UNISDR) and the Integrated Research on Disaster Risk (IRDR) to organise a workshop on loss data with key stakeholders and redevelop technical guidance documents. It also supported

attendance of the UK government at the 2017 Global Platform for Disaster Risk Reduction, providing some of the briefings for the UK Cabinet Office presentation and comments for the 'special event'.

Opportunities identified as areas for possible future work

Future work may include:

- working in collaboration to empower local authorities and other partners to work with civil society, communities and migrants at the local level, encouraging resilience to shocks at the household and community levels
- working with appropriate institutions to review – and where needed, update - disaster preparedness plans and programmes to consider all-hazard scenarios within 'build back better' in recovery, rehabilitation and reconstruction;
- strengthening and broadening international efforts through disaster risk reduction.
- working with planners, built environment professionals, builders and developers nationally and internationally to encourage planning and building now for the prevention and mitigation of climate change

Conclusion

PHE has demonstrated its commitment to reducing the numbers of people affected by disasters by publishing this national review of its progress on implementation of the Sendai Framework for Disaster Risk Reduction. Apparently, it is the first review of its kind to be made public and it is hoped that this review serves as a possible model for other departments within the UK government, as well as other countries to report their progress against implementing the Sendai Framework.

The review has identified a number of successes but also some opportunities in the work that PHE carries out, at the local, national, regional and global levels. The process of identifying progress and opportunities within PHE's work against the Sendai Framework will be an ongoing exercise. PHE will continue to focus on promoting world-class science and evidence by continuing to invest in science, research and innovation, and will further consolidate its position as a trusted, objective and authoritative source of evidence and knowledge. PHE will also continue to identify and tackle potential threats to the public's health with real world solutions.

Recommendations

PHE should annually update the proposed online tool mapping its work to the priorities of the Sendai Framework, and this process will be informed through extensive consultations with PHE staff working at the local, national and global levels, preferably linking these to other development agenda agreements, such as the Sustainable Development Goals and the COP 21 Paris Climate Agreement.

PHE should continue to take on a leadership role in working with local and national partners, particularly those within the health domain, to facilitate a cross-government approach to monitoring progress against the Sendai Framework.

Further work is undertaken to map research for disaster risk possibly in partnership with the UK Alliance for Disaster Research and other organisations.

Acknowledgements

Abbreviations

AMR	Antimicrobial Resistance
ANYWHERE	EnhANcing emergency management and response to extreme WeatHER and climate Events
AVA	Audio Visual Assessment tool
BIA	Business Impact Analysis tool
BST	Behavioural Science Team
CBRN	Chemical, Biological, Radioactive and Nuclear
CCDC	Consultant in Communicable Disease Control
CCS	Civil Contingencies Secretariat
CDC	Centers for Disease Control
CKO	Chief Knowledge Officer
CRCE	Centre for Radiation, Chemical and Environmental Hazards
COBR	Threats, hazards, resilience and contingencies
CODATA	Committee on Data for Science and Technology
COMAH	Control of Major Accident Hazards
DBAR	Digital Belt and Road
DfID	Department for International Development
DG ECHO	Directorate General for European Civil Protection and Humanitarian Aid
DH	Department of Health
DHIP	Digital Health Intelligence Platform
DRR	Disaster Risk Reduction
DRT	Disaster Recovery Tool
ECDC	European Centre for Disease Prevention and Control
ECH	Environmental Change and Health
EID	Emerging Infectious Diseases
EMETNET	European Multiple Environmental Emergencies Network
EOC	Emergency Operating Centre
EPM	Emergency Planning Managers
EPRR	Emergency Preparedness Resilience and Response
ERD ST	Emergency Response Department Science and Technology
EU	European Union
FATHUM	Forecasts for AnTicipatory HUManitarian action
FES	Field Epidemiology Service
FETP	Field Epidemiology Training Programme
FRANC	Forecasting Rainfall exploiting new data Assimilation techniques and Novel observations of Convection
GDRR	Global Disaster Risk Reduction
GIS	Geographical Information Systems
GOARN	Global Outbreak and Alert Network

GPDRR	Global Platform for Disaster Risk Reduction
HAIRS	Human Animal Infections Risk Surveillance
HEPE	Health and Environment Public Engagement Group
HFA	Hyogo Framework for Action
HIFA	Healthcare Information for All
HIWeather	High Impact Weather Programme
HMG	Her Majesty's Government
HPRU	Health Protection Research Unit
HSE	Health and Safety Executive
HTD	Hospital for Tropical Diseases
ICSU	International Council for Science
IHR	International Health Regulations
IMT	Incident Management Team
IRDR	Integrated Research on Disaster Risk
ISSC	International Social Science Council
IVR	Interactive Voice Response
JEE	Joint External Evaluation
KM	Knowledge Management
LMIC	Low to Middle Income Countries
LRF	Local Resilience Forum
LSTM	Liverpool School of Tropical Medicine
LSHTM	London School of Tropical Medicine and Hygiene
MERS-CoV	Middle East Respiratory Syndrome coronavirus
MEZE	Medical Entomology and Zoonoses Ecology
MIDAS	Meaningful Integration of Data Analytics and Services
NathNAC	National Travel Health Network and Centre
NEPNEI	National Expert Panel on New and Emerging Infections
NHP	Natural Hazards Partnership
NIS	National Infection Service
NRA	National Risk Assessment
NSAC	National Situational Awareness Cell
ODA	Overseas Development Assistance
OTSE	Off The Shelf Exercises
PANDHUB	Prevention and Management of High Threat Pathogen Incidents in Transport Hubs
PHE	Public Health England
PHEMC	Public Health Emergency Management Committee
PHNEOC	Public Health National Emergency Operations Centre
NGO	Non governmental organization
NHS	National Health Service
NIHR	National Institute for Health Research
ReSST	Real-time Syndromic Surveillance Team
RIPL	Rare and Imported Pathogens Laboratory

RRA	Rapid Risk Assessment
RST	Rapid Support Team
RTI	Research, Translation and Innovation
SAGE	Scientific and Advisory Group for Emergencies
SHEAR	Science for Humanitarian Emergencies and Resilience
SINATRA	Susceptibility of catchments to INTense Rainfall and flooding
SMS	Short Message Service
SSGP	Space for Smarter Government Programme
STAC	Scientific and Technical Advisory Committee
STAG	Scientific and Technical Advisory Group
STAR	Strategic Tool for Prioritising Risks
TENDERLY	Towards END-to-END flood forecasting and a tool for ReaL-time catchment susceptibility
TMHS	Travel and Migrant Health Services
UCLH	University College London Hospital
UK	United Kingdom
UKADR	United Kingdom Alliance for Disaster Research
UN	United Nations
UNISDR	United Nations Office for Disaster Risk Reduction
USAID	United States Agency for International Development
WHO	World Health Organization

Background

PHE and its role within the UK and globally

Public Health England (PHE) is an executive agency of the UK government's Department of Health and works across government at all levels. It is a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS in a professionally independent manner. PHE's mission is to 'protect and improve the nation's health and wellbeing, and reduce health inequalities'.

 As shown in Figure 1, PHE is responsible for:

- making the public healthier and reducing differences between the health of different groups by promoting healthier lifestyles, advising government and supporting action by local government, the NHS and the public
- protecting the nation from public health hazards
- preparing for and responding to public health emergencies
- improving the health of the whole population by sharing our information and expertise, and identifying and preparing for future public health challenges
- protecting the population from infectious disease through our life-course immunisation programme
- supporting local authorities and the NHS to plan and provide health and social care services such as immunisation and screening programmes, and to develop the public health system and its specialist workforce
- researching, collecting and analysing data to improve our understanding of public health challenges, and come up with answers to public health problems

Figure 1: Functions of PHE

PHE achieves this through world-class science, knowledge and intelligence, advocacy, partnerships and providing specialist public health services. Alongside the NHS, PHE supports the public to make choices which improve their health and wellbeing.

PHE has been structured to deliver its functions as shown in Figure 2. The Chief executive is accountable to the Secretary of State for Health within the UK government's Department of Health.

Figure 2: Diagram showing the internal governance structure of Public Health England
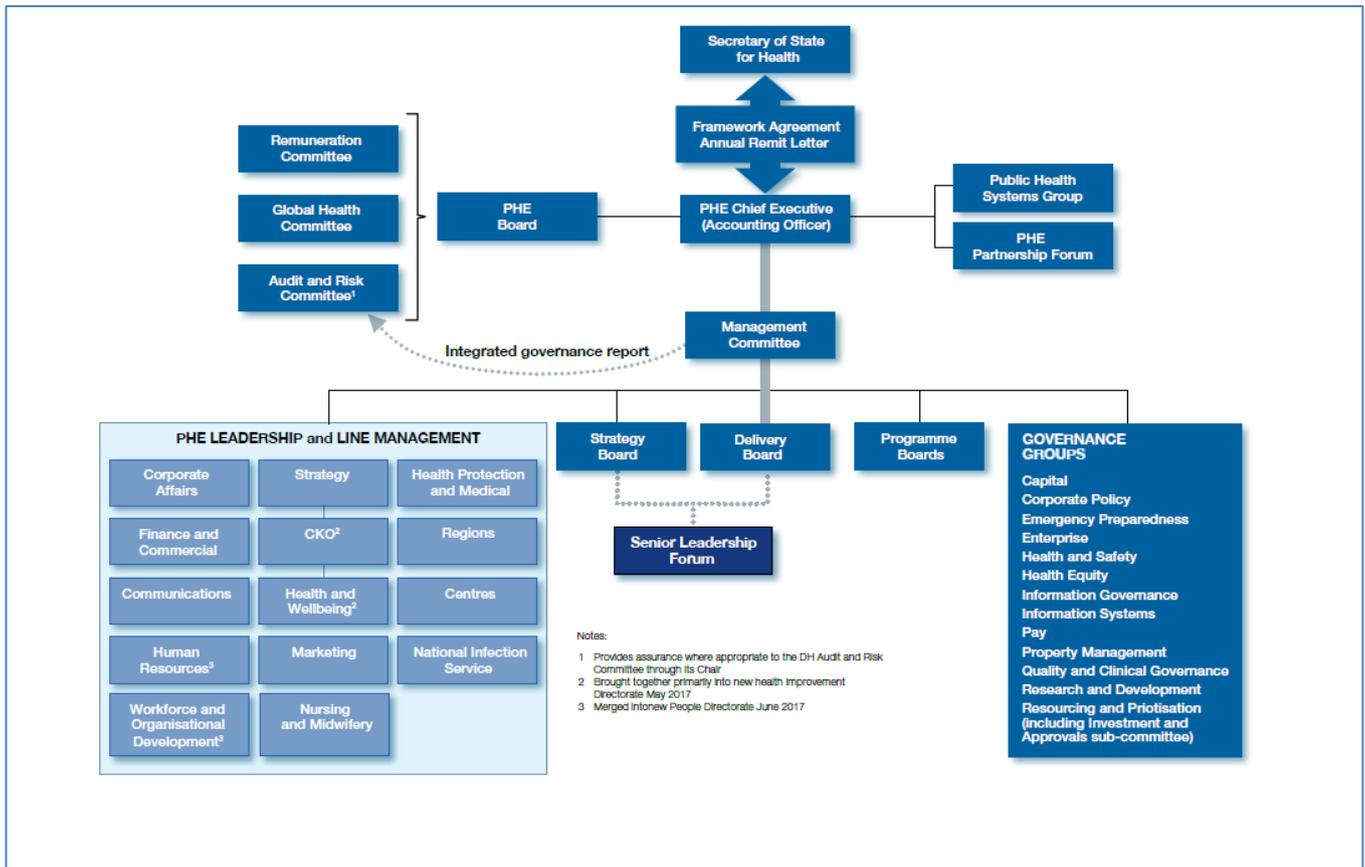
Source: PHE Annual Report and Accounts 2016/17

PHE employs 5,500 staff (full-time equivalent), mostly scientists, researchers and public health professionals. It works in 8 local centres, plus an integrated region and centre for London, and 4 regions (north of England, south of England, Midlands and east of England, and London). It also works closely with public health professionals in Wales, Scotland and Northern Ireland.

PHE not only works at a national level but is also influential globally. It supports the implementation of international agreements relating to public health, including: the International Health Regulations, Sustainable Development Goals, the Paris Agreement, and the Sendai Framework for Disaster Risk Reduction. For example, it regularly assists in conducting joint external evaluations which assess countries' compliance with the International Health Regulations.

The Sendai Framework for Disaster Risk Reduction 2015-2030

The Sendai Framework for Disaster Risk Reduction is a voluntary United Nations agreement which was signed by 187 UN member states. It offers governments the opportunity to enhance their disaster risk reduction capacities, by ensuring a role for multi-hazard management of disaster risk in all countries, at all scales and across all

sectors. It covers all hazards and disaster scenarios such as: small-scale and large-scale, frequent and infrequent, sudden and slow-onset, caused by natural or man-made hazards as well as related environmental, technological and biological hazards and risks. Yet, rather than focusing exclusively on the response to emergencies, it recognizes that by reducing and managing conditions of hazard, exposure, and vulnerability - while building the capacity of communities and countries for prevention, preparedness, response, and recovery - losses and impacts from disasters can be effectively alleviated. By 2030, the framework calls for:

'The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.'

The Sendai Framework sets 4 specific priorities for action. These are stated and expanded upon in Box 1:

Box 1: 4 priorities for action of the Sendai Framework

Priority 1: Understanding disaster risk:
"Disaster risk management should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment. Such knowledge can be used for risk assessment, prevention, mitigation, preparedness and response."

Priority 2: Strengthening disaster risk governance to manage disaster risk:
"Disaster risk governance at the national, regional and global levels is very important for prevention, mitigation, preparedness, response, recovery and rehabilitation. It fosters collaboration and partnership."

Priority 3: Investing in disaster risk reduction for resilience:
"Public and private investment in disaster risk prevention and reduction through structural and non-structural measures are essential to enhance the economic, social, health and cultural resilience of persons, communities, countries and their assets, as well as the environment."

Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction:
"The growth of disaster risk means there is a need to strengthen disaster preparedness for response, take action in anticipation of events and ensure capacities are in place for effective response and recovery at all levels. The recovery, rehabilitation and reconstruction phase is a critical opportunity to build back better, including through integrating DRR into development measures."

Source: Wahlstrom M. (2017) Social Work and the Sendai Framework for Disaster Risk Reduction. European Journal of Social Work, 20:3. 333-336.

The UK's progress on disaster risk reduction

The UK was the first country to undergo a peer review of its progress in monitoring the implementation of the Hyogo Framework for Action (HFA), which was the predecessor of the Sendai Framework. This report identified good practices and areas for improvement, and made recommendations to achieve further progress. However, the HFA centered more on responses to disasters, while the Sendai Framework builds on the HFA in that it also focusses on reducing disaster risks.

In 2011, the WHO assessed the status of England's health system's preparedness and in 2015, the UK was one of five countries to undergo a Global Health Security Assessment pilot assessment. The UK, amongst other countries, has also contributed to the development of a new Strategic Framework for Emergency Preparedness coordinated by the WHO.

A recent report published by the UN Secretary General on the implementation of the Sendai Framework, has indicated that member states have made significant progress in reducing disaster risk, but that enormous challenges remain. The report states that:

"Exposure of urban assets to sea level rise and flooding could reach $35 trillion by 2070, which is 10 times more than the current levels. Economic losses from earthquakes, tsunamis, cyclones and flooding alone are now reaching an average of $300 billion a year, with heavy impacts on key sectors such as infrastructure, energy, agriculture, environment, water, health and education."

In addition, climate change is acting as a 'force multiplier', disaster risk reduction, increasing the intensity, frequency and variability of extreme weather conditions and exacerbating slow-onset disasters such as drought. It is therefore critical that public and private investments in development are resilient to human and man-made hazards.

Aim of this review

Each signatory nation of the Sendai Framework is expected to report on progress against the framework's benchmarks. The aim of this review is therefore to assess PHE's activities and contribution to England's performance against the Sendai Framework for Disaster Risk Reduction, providing an overview of progress to date.

Methods

A half day workshop was held on 3 February 2017 with senior staff from a range of different departments within PHE, including:

- the Global Health Division
- Emergency Preparedness Resilience and Response (EPRR)
- the National Infection Service (NIS)
- Chemicals and Poisons Department within the Centre for Radiation, Chemical and Environmental Hazards (CRCE)
- Health and wellbeing
- Research, Translation and Innovation (RTI)
- Extreme Events and Health Protection within the Centre for Radiation, Chemical and Environmental Hazards (CRCE)

The workshop was facilitated by Professor Virginia Murray and members of the Global Disaster Risk Reduction team (GDRR) at PHE. This team has worked to ensure that public health and science have a prominent role in the Sendai Framework, and as part of its remit, continues to conduct robust, evidence-based research into disaster risk reduction.

Following a presentation on the Sendai Framework and its benchmarks, workshop participants were asked to read through each of the paragraphs of the 4 priorities for action identified in the Sendai Framework and identify examples of:

- PHE local and national work areas already being implemented which are aligned with the Sendai Framework
- PHE international work areas already being implemented which are aligned with the Sendai Framework
- research being undertaken by PHE to support implementation of the Sendai Framework both nationally and internationally

This workshop mapped several projects and PHE workstreams to the Sendai Framework priorities for action. It was then followed-up with a series of meetings and targeted email correspondence with senior members of departments within PHE who had not been able to attend the workshop.

Staff in PHE who were approached to contribute to the review process were also encouraged to share documents and links to projects and activities with the GDRR team. The GDRR team reviewed this information and incorporated any relevant details into the findings. A draft of the findings was then shared for comment with all those who had participated in the review in order to ensure, as far as possible, completeness and accuracy of the data collected. Given the size of PHE as an organization and complexity of its structure, as well as the extensive list of paragraphs associated with each of the 4 priorities, this process took approximately 6 months to complete.

Results

The Sendai Framework fits with a number of PHE's objectives both through its annual business plan and its wider strategic plan until 2020. This review has identified that as part of its core business, PHE undertakes a wide range of activities which are already consistent with the Sendai Framework priorities. It also indicates that PHE conducts several projects which go beyond its core business and are closely aligned with the Framework.

PHE is providing a high level of expertise and knowledge across the UK government at local and regional/national/global levels. Given the depth and range of work PHE is involved in, some selected examples are given below. However, the complete findings of the review will be made available through an interactive online tool, which will allow users to easily view the complete list of PHE activities and how they align to the Framework. The tool will also signpost users to further detailed information on these activities through hyperlinks.

PHE work locally and nationally

The Civil Contingencies Act (2004)

PHE is a Category 1 Responder under the Civil Contingencies Act (2004). The Civil Contingencies Act delivers a single framework for civil protection in the UK and is regarded as an important system for directing and facilitating emergency planning in England, forming the legal basis of PHE's National Incident and Emergency Response Plan. The National Incident and Emergency Response Plan provides the operational details of how PHE prepares for, responds to, and recovers from any public health related significant incident. This plan includes PHE supporting the National Security Council (Threats, Hazards, Resilience and Contingencies – also referred to as COBR), and providing scientific expertise to the Scientific Advisory Group for Emergencies (SAGE).

Category 1 organisations are at the core of the response to most emergencies. The work in PHE is led by the corporate resilience team which is responsible for Emergency Preparedness, Resilience and Response (EPRR) functions at the national level. Under their leadership, PHE is able to work effectively across government with partners such as the Cabinet Office's Civil Contingencies Secretariat from the local to national levels, to comply with the Civil Contingencies Act.

Priority 2: Strengthening disaster risk governance to manage disaster risk
Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction

---

The National Risk Register and National Risk Assessment of Civil Emergencies

PHE provides planning assistance for the National Risk Register of Civil Emergencies and National Risk Assessment. The National Risk Register provides an updated government assessment of the likelihood and potential impact of a range of different civil emergency risks (including naturally and accidentally occurring hazards and malicious threats) that may directly affect the UK over the next five years. It also provides information on how the UK government and local respondents such as emergency services prepare for these emergencies.

PHE assists in the identification of priority risks under the National Risk Assessment, assessing local risks and resilience through Local Resilience Forums (LRFs) and community risk registers. PHE also ensures that plans are in place t cover high priority health risks identified, and that this is translated at the local level through LRF risk registers and response plans.

Priority 1: Understanding disaster risk
Priority 2: Strengthening disaster risk governance to manage disaster risk

---

The National Infection Service

PHE's National Infection Service (NIS) exists to protect and improve the nation's health from infectious disease and reduce health inequalities arising from the burden of infectious disease. It leads to measurable improvements in communicable disease control evidenced by pre-specified population health impacts – pursuing both the reduction in the burden of infectious disease, protecting the public against the threat of outbreaks and minimising the impact of outbreaks in England. NIS ensures the best scientific evidence is used to manage communicable diseases and is led by eminent experts in infectious disease, ensuring the finest advice is provided to the government and the public to protect the nation from infection. Methods include: surveillance, planning and national implementation of immunisation programmes, support provided to the NHS, the provision of bulletins, and supporting resilience and response.

Priority 1: Understanding disaster risk
Priority 2: Strengthening disaster risk governance to manage disaster risk
Priority 3: Investing in disaster risk reduction for resilience
Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction

---

The Pandemic Influenza Response Plan

The threat from pandemic flu remains the top national risk and the Pandemic Influenza Response Plan details PHE's roles and responsibilities during the preparation for and response to a pandemic. The plan involves:
- PHE local and specialist centres working closely with partners at local and national levels.
- The development of integrated and detailed planning arrangements to address response organization and capacity, mutual aid and surge capacity, training, and coordination of media messages.
- The role of PHE working alongside and supporting the work of key partners within local health systems and local authorities , the NHS, Department of Health, devolved administrations and across other government departments

Priority 1: Understanding disaster risk
Priority 2: Strengthening disaster risk governance to manage disaster risk
Priority 3: Investing in disaster risk reduction for resilience
Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction

The Centre for Radiation, Chemical and Environmental Hazards

The PHE Centre for Radiation, Chemical and Environmental Hazards (CRCE) maintains emergency response arrangements and facilities in readiness for a wide range of chemical and environmental emergencies which may impact on public health.

Examples of some of its projects and work aligned with the Sendai Framework are given below:

- Commissioning of the National Poisons Information Service which is an information service commissioned by PHE on behalf of UK health departments.
- Having national response plans in place for extreme events such as the Cold Weather Plan for England, Heatwave Plan for England, National Flood Emergency Framework, and National Adaptation Plan.
- Publishing Chemical, Biological, Radioactive and Nuclear (CBRN) Recovery Handbooks for use in the remediation and recovery phase following a biological, chemical or radiation incident. Interactive tools also developed to support decision-making processes.
- Disseminating research on flooding and health: Flooding and health: National Study – exploring local impact on health particularly mental health; Use of routine health data for surveillance on the health effects of floods.
- Collaborating on projects with the National Adaptation Programme which set out what government, businesses and society are doing to adapt better to the changing climate.
- Working on an Impact Assessment Scale for natural hazards or manmade disasters.
- REACHING OUT which is a Horizon 2020 funded project, developing various disaster recovery and response tools

Priority 1: Understanding disaster risk
Priority 2: Strengthening disaster risk governance to manage disaster risk
Priority 3: Investing in disaster risk reduction for resilience
Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction

PHE work regionally and globally

UK Public Health Rapid Support Team

The UK Public Health Rapid Support Team, consists of clinicians, scientists and academics, who can be deployed to tackle outbreaks of disease in ODA elidgable countries around the world within 48 hours. They are on call to respond to urgent requests from countries around the world and fly in to help tackle disease outbreaks at source. Activities include undertaking a rapid risk assessment when on mission in country. When not responding to a disease outbreak, the team will research how best to deal with different types of outbreak. They will also train a group of public health reservists to make sure they are able to scale up the response to any disease outbreak or health emergency.

Priority 1: Understanding disaster risk
Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction

WHO Collaborating Centre on Mass Gatherings and Global Health Security

The WHO Collaborating Centre on Mass Gatherings and Global Health Security is housed within PHE and it's Terms of Reference are to:

- Provide support to the emergency and health protection preparedness programmes, strategies and policies of PHE and WHO at national, regional and global level, focusing on high visibility-high consequence events (including Mass Gatherings, such as the London 2012 Summer Olympics) and areas where cross government working is critical.
- Building on the combined expertise of WHO and the Collaborating Centre, develop exercises and training resources, jointly planned in collaboration with WHO, for preparation and response to mass gatherings and extreme events
- Build capacity to prepare and respond to mass gatherings and extreme events, and collaborate with WHO and its international networks to share experience and build capacity at international level in line with requirements of the International Health Regulations.
- Support and collaborate with the WHO Virtual Interdisciplinary Advisory Group on Mass Gatherings to develop and maintain guidance and standards for managing the public health impact of mass gatherings
- Consolidate and support Global Health Security activities and link to mass gatherings planning to help countries gain compliance with the International Health Regulations and reduce the global threat by building capacity and capability.
- Support the implementation of the United Nations International Strategy on Disaster Reduction and their Science and Technical Advisory Group supporting the delivery of an improved evidence base and an international mechanism for a post-2015 disaster risk reduction framework.

Priority 1: Understanding Disaster Risk
Priority 2: Strengthening disaster risk governance to manage disaster risk

---

PHE's Global Disaster Risk Reduction (GDRR) Team

PHE has a Global Disaster Risk Reduction (GDRR) team within its Global Public Health Division of the Health Protection/ Medical Directorate. This team has undertaken a number of activities, including:
- Engaging with international expert events across a number of roles such as; organising pre-conference events for the European Forum for Disaster Risk Reduction (Turkey, March 2017) on Gender-Responsive Strategies for Disaster Risk Reduction; Science and Technology to support Disaster Risk Reduction in Europe.
- Supporting organizations which ensure quality standard provision including: UK Alliance for Disaster Research (UKADR); preforming role of Vice Chair (2008 – 2017) of the Scientific and Technical Advisory Group (STAG) for United Nations Office for Disaster Risk Reduction (UNISDR); Integrated Research on Disaster Risk (IRDR) with the GDRR Consultant as a member of the scientific committee; Committee on Data for Science and Technology (CODATA) ; Digital Belt and Road (DBAR) Initiative; Evidence Aid
- Publishing research such as Disaster-Driven Evacuation and Medication Loss: a Systematic Literature Review; Medication supply for people evacuated during disasters.; A Systematic Review of the Health Impacts of Mass Earth Movements (Landslides); Excess Winter Deaths in Europe: a multi-country descriptive analysis; Power Outages, Extreme Events and Health: a Systematic Review of the Literature from 2011-2012
- Collaborating on research programmes, such as:
  - WHO Thematic platform: Disaster Risk Reduction for Health and High Impact Weather Programme (HIWeather) (WMO)
- Distributing the Global Hazards Weekly Bulletin with a subscriber base of >6000

Priority 1: Understanding disaster risk
Priority 2: Strengthening disaster risk governance to manage disaster risk

Initial gap analysis

The examples above showcase some of the work undertaken by PHE which successfully aligns with the Sendai Framework. However, this preliminary review has identified further gaps and therefore opportunities for PHE to align its work with the Sendai Framework. Future work may include:

- working in collaboration to empower local authorities and other partners to work with civil society, communities and migrants at the local level, encouraging resilience to shocks at the household and community levels;
- working with appropriate institutions to review – and where needed, update - disaster preparedness plans and programmes to consider all-hazard scenarios within 'build back better' in recovery, rehabilitation and reconstruction;
- strengthening and broadening international efforts through disaster risk reduction.

Although some of these opportunities possibly fall outside the remit of PHE, given this is the first review of its kind, PHE could take on a leadership role in facilitating a cross-government approach to monitoring progress against the Sendai Framework.

Conclusion and recommendations

This review has highlighted a number of areas where PHE is providing a high level of expertise and knowledge across the UK government at the local, regional, national and global level.

PHE has demonstrated its commitment to reducing the numbers of people affected by disasters by publishing this national review of its progress on implementation of the Sendai Framework for Disaster Risk Reduction. According to the authors, this is the first review of its kind to be made public and it is hoped that it serves as a possible model for other departments within the UK government, as well as other countries to report their progress against implementing the Sendai Framework.

Given the depth and range of work PHE is involved in, the complete findings of the review will be made available through an online tool, which will allow users to view the complete list of PHE activities and how they align to the Framework. Users will also be signposted to further detailed information on these activities through hyperlinks.

The review has identified a number of successes but also some gaps in the work that PHE carries out, both nationally and internationally. However, a limitation of this review is that it may not be exhaustively complete. Furthermore, the work of PHE is dynamic and evolving on a continuous basis. For that reason, the process of identifying progress and opportunities within PHE's work against the Sendai Framework will need to be an ongoing exercise.

PHE will be focusing on promoting world-class science and evidence by continuing to invest in science, research and innovation, and will further consolidate its position as a trusted, objective and authoritative source of evidence and knowledge. PHE will also continue to identify and tackle potential threats to the public's health with real world solutions.

Recommendations

PHE should annually update the proposed online tool mapping its work to the priorities of the Sendai Framework, and this process will be informed through extensive consultations with PHE staff working at the local, national and global levels, preferably linking these to other development agenda agreements, such as the Sustainable Development Goals and the COP 21 Paris Climate Agreement.

PHE should continue to take on a leadership role in working with local and national partners, particularly those within the health domain, to facilitate a cross-government approach to monitoring progress against the Sendai Framework.

Further work should be undertaken to map research for disaster risk possibly in partnership with the UK Alliance for Disaster Research and other organisations.

Finally, a limitation of this review is that it may not have covered all of PHE's activities and projects which align with the implementation of the Sendai Framework. Therefore, ongoing wide consultation and input from the organization will be essential to ensuring the majority of PHE's work in disaster risk reduction is reflected.

Additional sources of information

Cabinet Office. National Risk Register of Civil Emergencies. 2017. Available at:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/644968/UK_National_Risk_Register_2017.pdf

Civil Contingencies Act 2004. Available at:
http://www.legislation.gov.uk/ukpga/2004/36/contents

Global Health Security Agenda Pilot Assessment. 2015. Available at:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/456984/IndependentReport_GHS_acc.pdf

PHE. Annual Report and Accounts. 2016/17. Available at:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/629803/PHE_annual_report_2016_2017_web_version.pdf

PHE. Pandemic Influenza Response Plan 2014. Available at:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/344695/PI_Response_Plan_13_Aug.pdf

PHE. Strategic plan for the next four years: better outcomes by 2020. Available at:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/516985/PHE_Strategic_plan_2016.pdf

UNISDR. United Nations Office for Disaster Risk Reduction. Sendai Framework for Disaster Risk Reduction 2015-2030. Available at:
http://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf

UNISDR, OECD and ECHO. United Kingdom peer review report 2013 - Building resilience to disasters: implementation of the Hyogo Framework for Action (2005-2015). Available at: https://www.unisdr.org/we/inform/publications/32996

United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. Available at: http://www.preventionweb.net/publications/view/45418.

United Nations. (2015b). Paris Agreement. Available at:
http://www.preventionweb.net/publications/view/49265

United Nations General Assembly. Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030. Available at: http://reliefweb.int/report/world/implementation-sendai-framework-disaster-risk-reduction-2015-2030-report-secretary-0

Wahlstrom M. Social Work and the Sendai Framework for Disaster Risk Reduction. 2017. European Journal of Social Work, 20:3. 333-336.

WHO. WHO Collaborating Centre on Mass Gatherings and Global Health Security. Available at: http://apps.who.int/whocc/Detail.aspx?cc_ref=UNK-240&responsible_officer=barbeschi&

WHO.International Health Regulations. Available at: http://www.who.int/topics/international_health_regulations/en/

WHO. Assessment of health-system crisis preparedness: England. Available at: http://www.euro.who.int/en/health-topics/emergencies/disaster-preparedness-and-response/publications/2012/assessment-of-health-system-crisis-preparedness-england

Summary: local and national

The following section lists all of PHE's work locally and nationally which is relevant to the 4 priorities of the Sendai Framework for Disaster Risk Reduction. Some of the work it undertakes pertains to the organization as a whole, while other activities are specific to certain directorates within PHE.

A comprehensive mapping of how local and national PHE activities relate to each of the paragraphs listed under the 4 priorities is given in Annex 1.

PHE (overall)

- Civil Contingencies Secretariat National Capability Survey: Annual assessment of domestic Emergency Preparedness, Resilience and Response (EPRR) capability against set of core international standards. **(One: *24a*)**
- Planning assistance provided for National Risk Register of Civil Emergencies, 2015 edition **(One: *24n*; Two: *27(i), 27g*)**
- Category 1 Responder under Civil Contingencies Act (2004). **(Two: 27a(ii), 27a(iii), 27(iv), 27b, 27g)**
- National Incident & Emergency Response Plan includes measures to ensure support work programme and evidence based decision making. Provision of expertise to: Scientific Advisory Group for Emergencies (SAGE) and National Security Council (Threats, Hazards, Resilience and Contingencies or sometimes referred to as COBR). **(Four: *33i, 33m*)**
- Resilience assistance via establishment of operational support cells by Incident Management Team (IMT). **(Four: *33i, 33m*)**
    - Guidance available on sheltering or evacuation during an acute incident
    - Example publications dealing with issues in evacuation scenarios:
    - Disaster-Driven Evacuation and Medication Loss: a Systematic Literature Review
    - Medication supply for people evacuated during disasters.
- Engaged with completion of and implementation of findings from National Risk Assessment and Local Risk Assessments **(Two: *27b*)**
- Engagement from PHE, via local Emergency Planning Managers (EPMs) and Consultant in Communicable Disease Control (CCDCs), in Local Resilience Forum (LRFs) and community risk registers **(One: *24o*; Two: *27g*; Four: *3i*)**
- Member of Natural Hazards Partnership for Early Warning **(One: *24a*)**
- Engagement with UK Climate Change Risk Assessment 2017 **(One: *24b*)**
- PHE Centres Infectious Intestinal Disease and Influenza Like Illness Bulletins are regularly shared with NHS partners to inform service planning and response **(One: *24e*)**

- Real-time Syndromic Surveillance Team (ReSST) - Co-ordinate several national syndromic systems and produce routine syndromic surveillance bulletins and reports. **(One: *24g*)**
- Assisted Parliamentary Select Committee on "Science in emergencies: UK lessons from Ebola inquiry". **(One: *24g*; Two: *27e*)**
- Rare and Imported Pathogens Laboratory (RIPL) Imported fever service
- Investment in PHE's new Science Hub and Headquarters in Harlow **(Three: *30c*)**
- Published guidance to increase climate resilience of the healthcare estate (Health Building Note: HBN 00-07, April 2014) and to make energy work in healthcare (Health Technical Memorandum: HTM 07-02, March 2015). **(Three: *30e, 30h*)**
- Membership of the Cross-government overheating group **(Three: *30h*)**
- Engagement with UK Climate Change Risk Assessment 2017 **(Three: *30h*)**
- Medicines Management Group: **(Four: *33d*)**
  - Work includes stockpiling for emergency medications, vaccines, antidotes + anti-venoms as required.
- Peer reviewed publications for major hazardous events **(One: *24j*)**
  - The Buncefield Oil Depot Fire of 2005: Potential Air-Pollution Health Impacts Under Alternative Meteorological Scenarios

PHE Communications Directorate

- Monitor relevant social media and press. Involved in Emergency Exercise Communications: Divisional colleagues based at the Centre for Emergency Preparedness and Response take a lead in developing the communications elements of emergency exercises for major incidents, to allow testing of media handling arrangements at all levels, from the Local Resilience Forum through to national and international scenarios. **(One: *24f; 24o*)**
- PHE and National Health Service (NHS) England marketing campaign - Stay Well This Winter **(One: *24l, 24m*)**
- E-bug education program targeted to engage children **(One: *24l, 24m*)**
- Antibiotic guardian programme - campaign designed to raise awareness of the risks posed by antimicrobial resistance and to change behaviours around antibiotic use. **(One: *24m, 24n*)**
- Communications Department support for awareness campaign "Carbon Monoxide Awareness Week" **(One: *24m*)**

Chief Knowledge Officer (CKO)

- Develop skills and capacity in harvesting and collate practice-based examples from the local public health system to capture tacit knowledge about developing, implementing and evaluating public health programmes. **(One: *24i*)**
- Work with the cross-Government Knowledge Management (KM) Network group, and Five Nations KM/KLS leads to ensure collaboration and raise awareness of DRR **(One: *24m*; Two: *27a(iii)*)**

- To provide in-depth information science and knowledge management support to local priorities, and help build capacity and capability in the wider public health system **(One: *24m*; Two: *27a(iii)*)**
- Work with Evidence Aid, Healthcare Information for All (HIFA) and other partners on Knowledge Management in Global and Disaster Health scoping project (reviews, governance, expertise)
- Data collation, reporting to local authorities **(One: *24a*)**
- Digital Health Intelligence Platform (DHIP) will integrate DRR projects. **(One: *24g*)**
    - Role: Provide in-depth information science and knowledge management support to local priorities, and help build capacity and capability in the wider information support system
- Annual Review of Research includes several case studies relevant to DRR as well as linking to each Health Protection Research Units **(Three: *30i*)**
- 2017/2018 **(One: *24g, 24h*)**
    - A Knowledge Management programme to ensure that PHE manages its knowledge assets, including explicit and tacit knowledge, and uses these to support action, and to help translate knowledge into practice.
    - Develop skills and capacity in harvesting and collate practice-based examples from the local public health system to capture tacit knowledge about developing, implementing and evaluating public health programmes.

National Infection Service (NIS)

- Rapid Support Team (RST): Seconded epidemiologists and microbiologists, actively contributing to the development of the research strategy. **(One: *25a*)**
- Contributing to ODA (Overseas Development Assistance) -funded project to strengthen capability in a number of countries in the context of the International health Regulations. **(One: *25a*)**
- Provision of technical expertise, including field epidemiology, microbiology, IPC and C3 to outbreaks and incidents following requests from Global Outbreak and Alert Network (GOARN), ECDC or directly from affected countries to PHE. **(One: *25a;* Two: *28d*)**
- Expertise, governance, training and awareness support for GOARN
- Sierra Leone Capacity Building (Overall – One: 25a, 25g; Two: 28a, 28b, 28e, 28f; Three: 31a, 31e; Four: 34a, *34b, 34d, 34g, 34h*)
    - Support of implementation of WHO Strategic Tool for Prioritizing Risks (STAR) and development of disease outbreak specific plans with Ministry of Health and Sanitation. **(One: *25a, 25g;* Two: *28a*; Four: *34b*)**
    - Led to identification of 46 specific strategic level risks within the country. Plans are in place to develop a program of consolidation, assign risk leads and set out preparedness mechanisms.

- Convened Strategic Governance Group chaired by Sierra Leone's Chief Medical Officer. Routine outputs of the Group include strategy, policy and review documents. **(Two:** *28a, 28f*; **Three:** *31a, 31e*)
    - Formation of Public Health National Emergency Operations Centre (PHNEOC)
- 50 capacity 50 in Freetown, SL. Regular host to PHE FETP training packages, c.500 Ministry of Health staff trained in emergency management and EOC (Emergency Operating Centre) functionality thus far. Routine outputs incl.: quarterly newsletters and information dissemination. **(Two:** *28a, 28b, 28f*; **Three:** *31a, 31e*; **Four:** *34a, 34g, 34h* **)**
    - Convening and core implementation role of Public Health Emergency Management Committee (PHEMC) in Sierra Leone, which meets quarterly. **(Two:** *28a, 28f*; **Three:** *31a, 31e*)
    - PHNEOC is under the remit of this group.
- Enabled collaborative activity between national emergency preparedness actors in Sierra Leone and region. Organised visits to examine EOC structure and methods, and to develop a common framework for capacity building in the region. **(Two:** *28e, 28f*; **Three:** *31a, 31e*)
- Proactive in improving capacity through agreement between Emory University, USA and Njala University, Sierra Leone to investigate training and support programs for graduates. PHE opportunity to support ongoing development early stage professionals capacity (eg through engagement in lab settings) **(Three:** *31c*; **Four:** *34h*)
- Deployment of rapid response teams to assist Sierra Leone Ministry of Health following outbreak of Ebola in Guinea in 2016 **(Four:** *34a, 34d*)
    - Used draft response plans during incident, giving a solid reflection of advances present since previous Ebola response.
    - General technical support provided in Sierra Leone in EPRR and lab services.
    - Engaged in measures to enhance coordination between international partners, including: CDC (Centers for Disease Control) (USA), Chinese CDC, WHO, United Nations Development Programme, DfID and international Non-Governmental Organisations (NGO)
- Building of new labs in Makeni (2015) and Bo (2016) (diagnostic capacity). **(Four:** *34h*)
    - Refurbishment of another in Connaught scheduled to begin in May 2017.
- Mentorship and training programs provided for national laboratory staff **(Four:** *34h*)
- Agreement between Emory University, USA and Njala University, Sierra Leone to investigate training and support programs for graduates. **(Four:** *34h*)
    - Gave PHE opportunity to develop and put in place a support program for ongoing development of capacity of early stage professionals in country (eg through engagement in lab settings)

- Specific efforts in place which are developing certificate diplomas and masters degree level training in resilience and response in Sierra Leone. **(Four:** *34h***)**
- Program in place for Sierra Leone national to undertake diploma in national emergency planning at Loughborough University. **(Four:** *34h***)**
- Provision of bursaries by PHE/ London School of Hygiene and Tropical Medicine (LSHTM) for short course attendance by employees of the Government of Sierra Leone supporting work related to Global Health Security and Emergency Preparedness and response. **(Four:** *34h***)**
- Exists to protect and improve nation's health from infectious disease and reduce health inequalities arising from the burden of infectious disease. Methods include: surveillance, planning and national implementation of immunisation programmes, support provided to NHS, provision of bulletins, supporting resilience and response. **(Three:** *30i***)**
- Implementation of UK 5 Year Antimicrobial Resistance Strategy 2013 to 2018 – Recognises that the consequences extend beyond human health sector (societal and economic costs). **(One:** *24a***)**
    - Activities include: Contributing to the development of new situational awareness arrangements; routine activity in NIS to continue to improve surveillance and outbreak investigation and response; identification of new and emerging threats nationally and globally; UK preparedness and operational response to serious infectious diseases (H23 in the national risk assessment), some CBRN incidents are included in the scope; centres working closely with NHS provides and other partners including animal health to tackle AMR (Antimicrobial Resistance).

Centre for Radiation, Chemical and Environmental Hazards (CRCE)

- Control of Major Accident Hazards (COMAH)
    - PHE supports multi-agency emergency preparedness and response to incidents at COMAH sites. Includes staff participation in exercises, resource development. **(Three:** *30e, 30h, 30o***; Four:** *33k, 33l***)**
- Relevant publications: A guide to the Control of Major Accident Hazards Regulations (COMAH) 2015; Legislative developments: the Control of Major Accident Hazard Regulations 2015; Part 1: COMAH and the role of Public Health England; Part 2: Public health information in COMAH off-site emergency plans; Review of incidents occurring at COMAH sites in England and Wales, January 2009 – June 2011; Lessons learnt from a COMAH site exercise: A public health trainee's view; A review of Health Protection Agency involvement in incidents occurring at sites regulated under the Control of Major Accident Hazards (COMAH) Regulations D10:D19
- REACHING OUT: Horizon 2020 funded projected. Development of various disaster recovery and response tools. **(One:** *24a, 24h, 24i, 24j, 24k, 24l;* **Two:** *27a(ii), 27(iv), 27c, 27j;* **Three:** *30i, 30l;* **Four:** *33f, 33h, 33j, 33m, 33o, 33p***)**

- EMETNET (European Multiple Environmental Emergencies Network) is an European Union project part funded by DG ECHO (Directorate-General for European Civil Protection and Humanitarian Aid) – Development of rapid risk assessment and impact assessment methods on emerging environmental threats. **(One: *24a, 24n*; Two: *27b, 27g*)**
- CRCE commissions National Poisons Information Service **(Four: *33d*)**
- National response plans in place for extreme events: Cold Weather Plan for England, Heatwave Plan for England, National Flood Emergency Framework ,National Adaptation Plan **(One: *24g*; Two: *27b, 27f*; Three: *30f, 30g, 30h, 30i, 30j, 30m*)**
    - Support "Keep Warm, Keep Well" campaign **(Three: *30m*)**
- Chemical, Biological, Radioactive and Nuclear (CBRN) Recovery Handbooks for use in remediation and recovery phase following a biological, chemical or radiation incident. Interactive tools also developed to support decision—making processes. **(One: *24a*: Four: *33c, 33e, 33f, 33h, 33j*)**
- Outputs disseminated on flooding and health: Flooding and health: National Study – exploring local impact on health particularly mental health; Use of routine health data for surveillance on the health effects of floods. **(One: *24a*)** The National Study of Flooding and Health: Cohort study established by PHE in collaboration with partners following severe storms and floods in the winter of 2013/14 to improve our understanding of the impact of flooding on health with the aim of reducing the risks to public health and strengthening the response to future flooding events. Study included investigations into disruptive effects. **(Three: *30k*) (One: *24a*)**
- National Institute for Health Research Health Protection Research Units (NIHR HPRU) – are research partnerships between universities and Public Health England (PHE) and act as centres of excellence in multidisciplinary health protection research in England **(Four: *33j*)**
    - Health Protection Research Unit in Environmental Change and Health (HPRU ECH) produces various other publications. The aim of this HPRU is to enable health decisions makers to have the knowledge, foresight and tools to mitigate, adapt to and benefit from environmental change **(One: *24a, 24c, 24e*; Three: *30i*)**
    - NIHR HPRU in Emergency Preparedness and Response is led by King's College London, in partnership with Public Health England, the University of East Anglia and Newcastle University.
    - All published work is required to be open access. **(One: *24h*)**
    - Example "Evaluation of the impact on community morbidity and healthcare usage associated with Heatwaves using real-time syndromic surveillance". **(Three: *30h*)**
    - Flooding and Healthcare resilience: Aims to assess the impact upon health services and infrastructure associated with the December 2013 east coast storm surge (forthcoming publication). **(Three: *30i*)**

- Social and Political dynamics of flood risk, recovery and response. **(Three: *30i*)**
- Evaluation of morbidity and healthcare usage associated with Heatwaves. **(Three: *30i*)**
- Climate Change Adaptation Reporting Powers **(Three: *30k*)**
- Has public engagement strategy and is engaged with the Health and Environment Public Engagement Group (HEPE)
- Collaborate on projects with National Adaptation Programme **(One: *24b*)**
- Impact Assessment Scale for natural or manmade disasters. **(One: *24c*)**
- CBRN guidance – Chemical and Radiation Incidents Factsheet **(Three: *30i*)**
- PHE has developed arrangements for triggering and deployment of a health register: **(Four: *33n*)**
  - For example: Protocol for establishing a health register after a flood which provides a framework for countries to establish a health register after a flood event. The protocol is based on PHE's Major Incident Health Register Implementation Plan, written by members of the PHE Health Register Project Group.
- Ongoing work to develop plans for major incident health register for major health emergencies **(Four: *33n*)**

Emergency Preparedness, Resilience and Response (EPRR)

- PHE is a Category 1 Responder under Civil Contingencies Act (2004). **(Two: *27a(ii), 27a(iii), 27a(iv), 27b*)**
- Public Health Matters blog post describing work
- Cross-PHE engagement through guidance and alerts via delivery group, oversight groups, and Local Resilience Fora. Reach includes public and government stakeholders. **(One: *24a, 24g, 24i, 24l, 24o*; Three: *30i*; Four: *33f*)**
  - Processes: Sharing experiences, off shelf exercises with LRFs during Ebola, shared lessons from exercises (eg Exercise Cygnus, National Situational Awareness Cell). Coordination of national and local incident response plans. Face-to-face training courses include Emergo, Loggists' courses and STAC (Scientific and Technical Advisory Committee) Chair training. E-learning modules covering a wide range of topics.
- Construction of PHE situational awareness system (private) for DH, Civil Contingncies Secretariat (CCS) and NHS England. Work stream include NSAC - National Situational Awareness Cell. **(One: *24a*; Two: *27g – NSAC reports*)**
- Identification of priority risks under National Risk Assessment (NRA). Assess local risks and resilience through LRFs and community risk registers. **(Two: *27c*)**
- Information distribution: PHE contribute to process of this via publishing of timely guidance for health professionals and the public. Prior to disaster, and during disaster event itself. Situational awareness and altering mechanisms. Guidance for disease outbreaks of concern (ie Zika type info). **(Four: *33b*)**

- Ensure plans in place to cover high priority health risks in the NRA. (2013-2018). This is translated at local level through the Local Resilience For a risk registers and response plans. **(One: *24b*)**
- **Emergency Response Department Science and Technology (ERD (ST))**
- Geographic Information Systems (GIS) program (ArcGIS portal); Bio-terrorism and Emerging Disease Analysis (Modelling); Medical Entomology and Zoonoses Ecology (MEZE); Scientific Computing Team; Behavioural Science; Global disease outbreak monitoring and mapping **(One: *24a, 24c, 24d, 24f*)**
  - MEZE: Worldwide Horizion Scanning to develop understanding of global emerging infectious disease (EID) issues. Publications include: Enhanced West Nile virus surveillance in the North Kent marshes, UK; Colonization of a newly constructed urban wetland by mosquitoes in England: implications for nuisance and vector species **(Three: *30n, 30p*)**
- MIDAS - Meaningful Integration of Data Analytics and Services: Development of a big data platform which will manage and model existing healthcare and government data thus informing better long term policy making decision meetings **(One: *24a, 24b, 24f, 24h, 24k*; Two: *27j*)**
- PANDHUB (Prevention and Management of High Threat Pathogen Incidents in Transport Hubs): Systematic literature review, communication tools **(One: *24f, 24h, 24k, 24n*; Two: *27(iv)*; Three: *33b*)**
- FluTEST extension: To explore the validity of using social media monitoring to identify areas of public concern during a crisis. **(One: *24f, 24g*)**
- Work in line with MM HPRU Theme 4: To explore and improve the presentation of human behaviour within infectious disease models through identification, development, and collection of relevant psychological theory and research **(One: *24j, 24k*)**
- Work with World Health Organisation (WHO) Ebola - Investigation into the well-being of humanitarian workers in during and following overseas and local deployments to aid in disaster relief based on support systems such as organisational and mental health support. Includes recommendations as to best practice in supporting psychosocial well-being of deployed personnel. **(Three: *30i*; Four: *33o*)**
- Pipeline - Widespread dissemination of knowledge and training through the commercialisation of expert research to public, private and voluntary sectors. **(One: *24g*)**
- Phoenix - Working with UK wide fire services to carry out human volunteer trials to determine a best method of interim decontamination in the event of a CBRN incident. Testing and development of mass casualty decontamination procedures and making recommendations on the basis of evidence based findings. **(One: *24i, 24j*; Four: *33c*)**
- Carrying out work in line with EPR HPRU Theme 5 falls under the remit of this statement - Improving the operational effectiveness and perceived public acceptability of decontamination interventions, through in vitro experiments, focus groups studies, and human volunteer field trials. **(One: *24i*; Four: *33c*)**

- Research, Translation and Innovation (RTI) unit, examples of work: Porton Down, Research Programs **(One: *24k*)**
- PhD project (Radiation Risk Reduction) - toward the development of effective and evidence-based public health communication to inform of protective preparedness behaviours and actions to take in immediate response to radiation incidents including civil emergencies and deliberate releases. **(One: *24l, 24m, 24n*; Two: *27a(iii)*; Three: *33b*)**
- Membership of the Human Animal Infections Risk Surveillance (HAIRS) group which inputs into DH's National Expert Panel on New and Emerging Infections (NEPNEI).
  - HAIRS Report 2013-2015 **(Three: *30p*)**
- Off The Shelf Exercises (OTSE). Designed for health concerns in an English setting, but with an element of multi-agency engagement. Current titles: Business Continuity, Chemical Hazmat, Burns, Communicable Disease, Hospital Evacuation, Pandemic Influenza, Viral Haemorrhagic Fever, Winter Pressures and Mass Casualty. **(Three: *30e, 30i*; Four: *33h*)**
  - Under development incl: Heat Wave, Fuel Disruption and Nursing Home Evacuation.
- EPR HPRU Theme 7 - Enhancing emergency preparedness through improved exercises and training **(Four: *33h*)**
- Pandemic Influenza Response Plan **(One: *24a*; Three: *30i*)**
- E-learning resources: Flooding e-learning module for PHE, NHS and Ministry of Defence (clinical) staff; Sustainability e-learning module. **(Three: *30e, 30i*)**
- Guidance documents include information on long standing conditions and health seeking behaviour. **(Three: *30k*)**
- Research on medications and evacuations**(Three: *30k*):**
  - Disaster-Driven Evacuation and Medication Loss: a Systematic Literature Review
  - Medication supply for people evacuated during disasters.
- Business Continuity Management System for PHE (organisation specific). Includes Business Impact Analysis (BIA) tool as part of business continuity management programme. **(Three: *30o*; Four: *33g*)**

Summary: regional and global

The following section lists all of PHE's work regionally and globally which is relevant to the 4 priorities of the Sendai Framework for Disaster Risk Reduction. Some of the work it undertakes pertains to the organization as a whole, while other activities are specific to certain directorates within PHE.

A comprehensive mapping of how regional and global PHE activities relate to each of the paragraphs listed under the 4 priorities is given in Annex 2.

PHE (overall)

- Civil Contingencies Secretariat National Capability Survey: Annual assessment of domestic EPRR capability against set of core international standards. **(One: *25b*)**
- Priority outlined in PHE Global Health Strategy (2014 to 2019) to "Improving global health security and meeting responsibilities under the International Health Regulations" **(One: *25b*; Two: *28a, 28b*; Three: *31a, 31e*)**
- Iinternational Health Regulations (IHR) support: Strengthening capacity in Low to Middle Income Countries (LMIC) and AFRO region; Assistance to WHO, including WHE, monitoring and evaluation programme and provision of technical experts to Joint External Evaluations in no. of countries. **(One: *25b*; Two: *28a, 28b*; Three: *31a*)**
- Field Epidemiology Training Programme (FETP) **(Four: *34a, 34g*)**
    - Aims: Evaluate surveillance systems and help strengthen surveillance systems through recommendations, based on programme of teaching, training and outbreak investigation. Aim to aid those in other countries through teaching and training from those who graduate the programme. Has remit at local, national, regional and global levels.
    - Programme is part of RST engagement through IHR work going forwards.
- Rare and imported pathogens laboratory (RIPL) Imported fever service **(Four, *34a*)**
    - 24-hour, 7-day a week telephone access to expert clinical and microbiological advice to support management of febrile patients, infection control and public health interventions. 24 hour on-call molecular diagnostic service for viral haemorrhagic fevers and certain key differential diagnoses eg malaria, dengue. Next working day diagnostic service for a range of other acute imported fevers such as chikungunya and rickettsias. Panels of diagnostic tests designed for 10 world regions, with the aim of delivering a positive diagnosis rather than ruling out single infections - Field Epidemiology Training Programme (FETP)
- Control of Major Accident Hazards Regulations (COMAH)
- PHE supports multi-agency emergency preparedness and response to incidents at COMAH sites. Includes staff participation in exercises, resource development. **(Four: *34d*)**

- Relevant publications: A guide to the Control of Major Accident Hazards Regulations (COMAH) 2015; Legislative developments: the Control of Major Accident Hazard Regulations 2015; Part 1: COMAH and the role of Public Health England; Part 2: Public health information in COMAH off-site emergency plans; Review of incidents occurring at COMAH sites in England and Wales, January 2009 – June 2011; Lessons learnt from a COMAH site exercise: A public health trainee's view; A review of Health Protection Agency involvement in incidents occurring at sites regulated under the Control of Major Accident Hazards (COMAH) Regulations D10:D19

Chief Knowledge Officer (CKO)

- Work with Evidence Aid, HIFA and other partners on Knowledge Management in Global and Disaster Health scoping project (reviews, governance, expertise) **(One: *25d, 25h*)**

Centre for Radiation, Chemical and Environmental Hazards (CRCE)

- REACHING OUT: Horizon 2020 funded projected. Development of various disaster recovery and response tools. **(One: *25a, 25c*; Two: *28b, 28f*; Four: *34a*)**
- EMETNET (European Multiple Environmental Emergencies Network) is an EU project part funded by DG ECHO (Directorate-General for European Civil Protection and Humanitarian Aid) – Development of rapid risk assessment and impact assessment methods on emerging environmental threats. **(One: *25a, 25c*; Two: *28b, 28f*; Four: *34a*)**
- CBRN Recovery Handbooks for use in remediation and recovery phase following a biological, chemical or radiation incident. Interactive tools also developed to support decision—making processes. **(Two: *28e*)**
- (w GDRR). Providing health related expertise and knowledge on three University of Reading projects: **(Four, *34e*)**
    - Forecasting Rainfall exploiting new data Assimilation techniques and Novel observations of Convection (FRANC); Susceptibility of catchments to INTense RAinfall and flooding (SINATRA); Towards END-to End flood forecasting and a tool for ReaL-time catchment susceptibility (TENDERLY)

Emergency Response Department (ERD)

- Training provision under contract WHO, United Nations Food and Agricultural Organisation, European Comission, European Centre of Disease Control and USAID (United States Agency for International Development). **(One: *25e*; Four: *34a*)**
- Geographic Information Systems (GIS) program; Bio-terrorism and Emerging Disease Analysis (Modelling); Medical Entomology and Zoonoses Ecology (MEZE);

Scientific Computing Team; Behavioural Science; Global disease outbreak monitoring and mapping **(One: *25i*)**

- MEZE: Worldwide Horizon Scanning to develop understanding of global EID issues. Publications include: Enhanced West Nile virus surveillance in the North Kent marshes, UK; Colonization of a newly constructed urban wetland by mosquitoes in England: implications for nuisance and vector species. **(Two: *28d*)**

- Membership of the Human Animal Infections Risk Surveillance (HAIRS) group which inputs into DH's National Expert Panel on New and Emerging Infections (NEPNEI). **(Two: *28d*)**
  - HAIRS Report 2013-2015
- Off The Shelf Exercises (OTSE). Designed for health concerns in an English setting, but with an element of multi-agency engagement. Current titles: Business Continuity, Chemical Hazmat, Burns, Communicable Disease, Hospital Evacuation, Pandemic Influenza, Viral Haemorrhagic Fever, Winter Pressures and Mass Casualty. **(Four: *34f*)**
  - Under development incl: Heat Wave, Fuel Disruption and Nursing Home Evacuation.

Global Public Health

- UK Public Health Rapid Support Team (RST) **(One: *24c*; Four: *33o, 33p*)**
  - They will be on call to respond to urgent requests from countries around the world and fly in to help tackle disease outbreaks at source. Activities include undertaking a rapid risk assessment when on mission in country.

- NICC (National Incident Coordination Centre) Ebola management included: Ebola virus disease: epidemiological update **(One: *24c*; Four: *33o*)**
- National and local structured debriefs of major incidents and exercises **(One: *24c*)**
- WHO Collaborating Centre on Mass Gatherings and Global Health Security - Provision of risk assessment framework and strengthening IHR (International Health Regulations) compliance through planning and delivering mass gatherings, Delivery of training and exercises for delivering public health best practice at mass gatherings.
- IHR National Focal Point. UK comms function sits within PHE, includes reporting. **(Four: *33p*)**
- Implementation, with DfID (Department for International Development), of public health system strengthening programmes in Sierra Leone and Pakistan.
- Development and leadership on UK's Radiation Emergency Preparedness Service Engaged in efforts with European Centre for Disease Prevention and Control (ECDC)
  - PHE working with WHO-Geneva as part of international initiative to develop framework and associated function specific handbooks for public health emergency operations centres.

- Priority outlined in PHE Global Health Strategy (2014 to 2019) to "Improving global health security and meeting responsibilities under the International Health Regulations." **(Two: *27(iii), 27(iv),* 27g; Three: *30a*; Four: *33p*)** (applies to domestic health security)
- Field Epidemiology Training Programme (FETP) **(Three: *30i;* Four: *33n*)**
- Travel and Migrant Health Services (TMHS): PHE travel and migrant health team supports migration team in home office. **(Three: *30l*)**
  - Published Migrant Health Guide
- Recent event responses engaged: Ebola in West Africa; Chikungunya in the Caribbean; Avian influenza; Middle East respiratory syndrome coronavirus (MERS-CoV)
- Commissions NathNAC (National Travel Health Network and Centre) - Advice line is for health professionals who have queries about travel scenarios that involve either complex itineraries or travellers with special health needs. **(Three: *30l, 30q*)**
- UK Public Health Rapid Support Team (RST) **(One: *25a, 25d;* Two: *28a*; Four: *34h*)**
  - They will be on call to respond to urgent requests from countries around the world and fly in to help tackle disease outbreaks at source. Activities include undertaking a rapid risk assessment when on mission in country.
- WHO Collaborating Centre on Mass Gatherings and Global Health Security - Provision of risk assessment framework and strengthening IHR compliance through planning and delivering mass gatherings, Delivery of training and exercises for delivering public health best practice at mass gatherings. **(Two: *28e*)**
- IHR National Focal Point. UK comms function sits within PHE, includes reporting. **(Two: *28f*)**
- Implementation, with DfID, of public health system strengthening programmes in Sierra Leone and Pakistan. (**Three: *31a*)**
- Deployment of mobile labs in response to Ebola outbreak in Sierra Leone **(Four: *34a*)**
- Provision of support to WHO, including WHE and the monitoring and evaluation programme to enhance IHR compliance; including provision of technical experts to Joint External Evaluations in a range of countries. **(Four: *34a*)**
- Development and leadership on UK's Radiation Emergency Preparedness Service **(Four: *34b*)**
- Engaged in efforts with European Centre for Disease Prevention and Control (ECDC)
  - PHE working with WHO-Geneva as part of international initiative to develop framework and associated function specific handbooks for public health emergency operations centres. **(Four: *34b*)**

Global Disaster Risk Reduction (GDRR)

- Support for organizations which ensure quality standard provision including: UK Alliance for Disaster Research (UKADR); Scientific and Technical Advisory Group (STAG) for United Nations Office for Disaster Risk Reduction (UNISDR) *GDRR Consultant performing role of Vice-Chair*; Integrated Research on Disaster Risk (IRDR) *GDRR Consultant is member of scientific committee;* CODATA; Digital Belt and Road (DBAR) Initiative; Evidence Aid **(One: *25c, 25d, 25h*; Two: *28b*; Three: *31b, 31c*; ; Four: *34a*)**
- Involved in a series of research programmes **(One: *25a, 25d, 25g*)**:
    - Forecasts for AnTicipatory HUManitarian action (FATHUM) (RCUK)
    - Science for Humanitarian Emergencies & Resilience (SHEAR) (NERC funded)
    - EnhANcing emergencY management and response to extreme WeatHER and climate Events (ANYWHERE) (Horizon 2020)
    - High Impact Weather Programme (HIWeather) (WMO)
- Distribution of Global Hazards Weekly Bulletin (subscriber base >6,000) **(One: *25e*; Two: *28f*)**
- Research methodology and outputs used on global level:
    - Supported UNISDR processing outputs of UN Open-Ended Intergovernmental Working Group on indicators and terminology relating to disaster risk reduction as part of SFDRR monitoring process. **(One: *25g*; Two: *28f*)**
- Redevelopment of technical guidance documents.
- Co-organisation with UNISDR and Intergrated Research for Disaster Risk (IRDR) of Loss Data Workshop hosted in Royal Society, London in February 2017.
- Briefing provision for UK Cabinet Office presentation and comments Special Event during 2017 GPDRR.
    - Development role in WHO's safer hospitals campaign **(One: *25f*)**
    - Noting impact of publication of "Review of five London hospital fires and their management JANUARY 2008 – FEBRUARY 2009"
    - Use of GIS in Japan - The Great East Japan Earthquake Disaster: Distribution of Hospital Damage in Miyagi Prefecture **(One: *25i*)**
- Collaborative activity on modelling impacts with the Institute for Health Metrics and Evaluation (Seattle, USA) for the Global Burden of Disease programme. **(One: *25c, 25e*)**
- Engaged with international expert events across a number of roles including: representation, organisation, deliberation activities and output process. **(Two: *28c, 28f*)** Includes:
    - European Forum for Disaster Risk Reduction (Turkey, March 2017). Pre-conference event organisation: Gender-Responsive Strategies for Disaster Risk Reduction; Science and Technology to support Disaster Risk Reduction in Europe.
    - Global Platform for Disaster Risk Reduction (Mexico, May 2017)

Annex 1: local and national

Para no.	Sendai Framework for Disaster Risk Reduction – Text	PHE example projects
Priority 1: Understanding Disaster Risk		
24a	To promote the collection, analysis, management and use of relevant data and practical information and ensure its dissemination, taking into account the needs of different categories of users, as appropriate	• **PHE**: Member of Natural Hazards Partnership for Early Warning, Pandemic Influenza Response Plan, National Risk Assessment • **EPRR**: PHE situational awareness system, NSAC - National Situational Awareness Cell • **CRCE**: Flooding and health: National Study, Health Protection Research Unit in Environmental Change and Health (HPRU ECH); REACHING OUT • **ERD-ST**: MIDAS - Meaningful Integration of Data Analytics and Services • **GDRR**: Publication of the Global Hazards Weekly Bulletin • **NIS**: UK 5 Year Antimicrobial Resistance Strategy 2013 to 2018 • **CRCE** has developed a waste fire incident database and emergency preparedness and response tool for predicting exposures and impacts associated with fires (SEaR) and the CRCE Incident Reporting and Information System records actions, decisions and information relating to chemical, radiation and other environmental incidents and can also be used for surveillance and statistics
24b	To encourage the use of and strengthening of baselines and periodically assess disaster risks, vulnerability, capacity, exposure, hazard characteristics and their possible sequential effects at the relevant social and spatial scale on ecosystems, in line with national circumstances	• **EPRR**: National Risk Assessment • **CRCE**: National Adaptation Programme • **PHE**: Engagement with UK Climate Change Risk Assessment 2017 • **ERD-ST**: MIDAS - Meaningful Integration of Data Analytics and Services
24c	To develop, periodically update and disseminate, as appropriate, location-based disaster risk information, including risk maps, to decision makers, the general public and communities at risk of exposure to disaster in an appropriate format by using, as applicable, geospatial information technology	• **ERD ST**: Explanation of Portal for ArcGIS, MIDAS - Meaningful Integration of Data Analytics and Services

24d	To systematically evaluate, record, share and publicly account for disaster losses and understand the economic, social, health, education, environmental and cultural heritage impacts, as appropriate, in the context of event-specific hazard-exposure and vulnerability information	• **PHE**: Collaborates with the Institute for Health Metrics and Evaluation on the Global Burden of Disease programme. It includes the modelling of the disease burden due to "Forces of nature, war and legal interventions". Global Burden of Disease visualization application. • **CRCE**: Evaluation of the impact and responses associated with 2013 heatwave in England (forthcoming publication), Flooding and health: National Study; Health Protection Research Unit in Environmental Change and Health (NIHR-ECH),Social and Political dynamics of flood risk, recovery and response.,Evaluation of morbidity and healthcare usage associated with Heatwaves., EMETNET (European Multiple Environmental Emergencies Network), Impact Assessment Scale for natural or manmade disasters. • **PHE Health Protection**: NICC (National Incident Coordination Centre) Ebola Management, UK Public Health Rapid Support Team (RST)
24e	To make non-sensitive hazard-exposure, vulnerability, risk, disaster and loss-disaggregated information freely available and accessible, as appropriate	• **PHE overall**: Collaborates with the Institute for Health Metrics and Evaluation on the Global Burden of Disease programme. It includes the modelling of the disease burden due to "Forces of nature, war and legal interventions". Global Burden of Disease visualization application • National Institute for Health Research (NIHR) Health Protection Research Unit (HPRUs): • All published work is required to be open access • Outputs include open-access journals. Data sets also available. • NIHR HPRU in Emergency Preparedness and Response: led by King's College London, in partnership with Public Health England, the University of East Anglia and Newcastle University.
24f	To promote real time access to reliable data, make use of space and in situ information, including geographic information systems (GIS), and use information and communications technology innovations to enhance measurement tools and the collection, analysis and dissemination of data	• **PHE**: Collaborates with the Institute for Health Metrics and Evaluation on the Global Burden of Disease programme. It includes the modelling of the disease burden due to "Forces of nature, war and legal interventions". Global Burden of Disease visualization application. • **ERD ST**: Geographical Information Systems (GIS), Bio-terrorism and Emerging Disease Analysis (Modelling), Medical Entomology and Zoonoses Ecology (MEZE), Scientific Computing Team, Behavioural Science Team, Global disease outbreak monitoring and mapping; MIDAS - Meaningful Integration of Data Analytics and Services, PANDHUB (Prevention and Management of High Threat Pathogen Incidents in Transport Hubs) and FluTEST extension • **PHE Communications Directorate**: Monitoring of all relevant social media network and press coverage of events; involved in Emergency Exercise Communications: Divisional colleagues based at the Centre for Emergency Preparedness and Response take a lead in developing the communications elements of emergency exercises for major incidents, to allow testing of media handling arrangements at all levels, from the Local Resilience Forum through to national and international scenarios

24g	To build the knowledge of government officials at all levels, civil society, communities and volunteers, as well as the private sector, through sharing experiences, lessons learned, good practices and training and education on disaster risk reduction, including the use of existing training and education mechanisms and peer learning	• **EPRR**: Alerts internally for PHE and across HMG (Her Majesty's Government), linked at local level through Local Resilience Forums (LRFs); Processes: Sharing experiences, off shelf exercises with LRFs during Ebola, shared lessons from exercises • **CKO**: Digital Health Intelligence Platform (DHIP) will integrate DRR projects. • **CRCE**: Cold Weather Plan for England, including the Annual Cold Weather Plan Seminar, Winter Health Watch and associated public and professional communications and guidance; Heatwave Plan for England, including the Annual Heatwave Plan Seminar and associated public and professional communications and guidance; National Flood Emergency Framework, Chemicals and Poisons: EMETNET (European Multiple Environmental Emergencies Network) • **PHE**: Real-time Syndromic Surveillance Team (ReSST) co-ordinate several national syndromic systems and produce routine syndromic surveillance bulletins and reports; Assistance provided for Parliamentary Select Committee on "Science in emergencies: UK lessons from Ebola". • **ERD-ST**: MIDAS - Meaningful Integration of Data Analytics and Services; PANDHUB (Prevention and Management of High Threat Pathogen Incidents in Transport Hubs): FluTEST extension; Pipeline - Widespread dissemination of knowledge and training through the commercialisation of expert research to public, private and voluntary sectors; Carrying out work in line with MM HPRU Theme 4 falls under the remit of this statement: To explore and improve the presentation of human behaviour within infectious disease models through identification, development, and collection of relevant psychological theory and research
24h	To promote and improve dialogue and cooperation among scientific and technological communities, other relevant stakeholders and policymakers in order to facilitate a science/policy interface for effective decision-making in disaster risk management	• **ERD-ST**: MIDAS - Meaningful Integration of Data Analytics and Services; PANDHUB (Prevention and Management of High Threat Pathogen Incidents in Transport Hubs) • **CKO**: Knowledge mobilisation efforts • **PHE**: National Institute for Health Research (NIHR) Health Protection Research Unit (HPRUs): All published work is required to be open access; Outputs include open-access journals;Collaborates with the Institute for Health Metrics and Evaluation on the Global Burden of Disease programme. It includes the modelling of the disease burden due to "Forces of nature, war and legal interventions". Global Burden of Disease visualization application; Support provided for: UKADR; Provided support at SAGE and DH, wider cross-governmental meetings including COBR. • **CRCE** was part of the DG ECHO Cross-border Exposure characterisation for Risk Assessment in Chemical Incidents (CERACI) project. Related publication: Assessing and improving cross-border chemical incident preparedness and response across Europe and REACHING OUT project

24i	To ensure the use of traditional, indigenous and local knowledge and practices, as appropriate, to complement scientific knowledge in disaster risk assessment and the development and implementation of policies, strategies, plans and programmes of specific sectors, with a cross-sectoral approach, which should be tailored to localities and to the context	**EPRR**: Process: National to local, EPRR delivery group - Health Protection: Included in work of units under remit of Health Protection Directorate; Engagement occurs with LRFs **ERD-ST**: REACHING OUT; Phoenix - Working with UK wide fire services to carry out human volunteer trials to determine a best method of interim decontamination in the event of a CBRN incident. Testing and development of mass casualty decontamination procedures and making recommendations on the basis of evidence based findings; Carrying out work in line with EPR HPRU Theme 5 falls under the remit of this statement - Improving the operational effectiveness and perceived public acceptability of decontamination interventions, through in vitro experiments, focus groups studies, and human volunteer field trials
24j	To strengthen technical and scientific capacity to capitalize on and consolidate existing knowledge and to develop and apply methodologies and models to assess disaster risks, vulnerabilities and exposure to all hazards	**ERD ST**: Geographical Information Systems (GIS), Bio-terrorism and Emerging Disease Analysis (Modelling), Medical Entomology and Zoonoses Ecology (MEZE), Scientific Computing Team, Behavioural Science Team, Global disease outbreak monitoring and mapping; MIDAS - Meaningful Integration of Data Analytics and Services, PANDHUB (Prevention and Management of High Threat Pathogen Incidents in Transport Hubs), FluTEST extension; Behavioural sciences: **CRCE**: REACHING OUT- Demonstration of EU effective large scale threat and crisis management outside the EU; Phoenix; Pipeline - Widespread dissemination of knowledge and training through the commercialisation of expert research to public, private and voluntary sectors; Carrying out work in line with MM HPRU Theme 4 falls under the remit of this statement: To explore and improve the presentation of human behaviour within infectious disease models through identification, development, and collection of relevant psychological theory and research; developed a waste fire incident database and emergency preparedness and response tool for predicting exposures and impacts associated with fires (SEaR); CRCE publications related to developing and applying methodologies and models to assess vulnerabilities and exposures: An evidence-based approach to protect public health during prolonged fires, Building ventilation strategies to protect public health during chemical emergencies, INGRESS project: providing the evidence base for shelter-in-place advice for chemical incidents. CRCE also provides the secretariat for the UK Atmospheric Dispersion Modelling Liaison Committee which funds modelling-related projects addressing operational issues related to exposure assessment **PHE Communications Directorate**: Monitoring of all relevant social media network and press coverage of events; involved in Emergency Exercise Communications: Divisional colleagues based at the Centre for Emergency Preparedness and Response take a lead in developing the communications elements of emergency exercises for major incidents, to allow testing of media handling arrangements at all levels, from the Local Resilience Forum through to national and international scenarios. **CKO**: Collaborates with the Institute for Health Metrics and Evaluation on the Global Burden of Disease programme. It includes the modelling of the disease burden due to "Forces of nature, war

		and legal interventions". Global Burden of Disease visualization application. • **PHE**: Evaluation of responses: Peer reviewed publications for major hazardous events: The Buncefield Oil Depot Fire of 2005: Potential Air-Pollution Health Impacts Under Alternative Meteorological Scenarios; • **GDRR**: provided support to the UK Alliance for Disaster Research (UKADR)
24k	To promote investments in innovation and technology development in long-term, multihazard and solution-driven research in disaster risk management to address gaps, obstacles, interdependencies and social, economic, educational and environmental challenges and disaster risks	• **CRCE**: REACHING OUT project • **CKO**: Work led through Research, Translation and Innovation (RTI) unit • **ERD-ST**: REACHING OUT; MIDAS - Meaningful Integration of Data Analytics and Services; PANDHUB (Prevention and Management of High Threat Pathogen Incidents in Transport Hubs); Carrying out work in line with MM HPRU Theme 4 falls under the remit of this statement: To explore and improve the presentation of human behaviour within infectious disease models through identification, development, and collection of relevant psychological theory and research
24l	To promote the incorporation of disaster risk knowledge, including disaster prevention, mitigation, preparedness, response, recovery and rehabilitation, in formal and non-formal education, as well as in civic education at all levels, as well as in professional education and training	• **ERD ST/EPRR**: Engaged in provision of training and exercise programmes. Both routine and emergency based: Including programs run for radiation, environmental levels of chemicals, environmental change, and extreme weather events such as flooding, infectious disease outbreaks; Face-to-face training courses include Emergo, Loggists' courses and STAC Chair training; E-learning modules covering a wide range of topics; Pipeline - Widespread dissemination of knowledge and training through the commercialisation of expert research to public, private and voluntary sectors; PhD project (Radiation Risk Reduction) - toward the development of effective and evidence-based public health communication to inform of protective preparedness behaviours and actions to take in immediate response to radiation incidents including civil emergencies and deliberate releases • **PHE**: PHE and NHS England marketing campaign - Stay Well This Winter; Other trainings: Flooding e-learning module for PHE, NHS and MoD (clinical) staff; Off the Shelf Cold Weather Exercise; Off the Shelf Heatwave Exercise (forthcoming); E-bug education program targeted to engage children • **CRCE**: REACHING OUT project

24m	To promote national strategies to strengthen public education and awareness in disaster risk reduction, including disaster risk information and knowledge, through campaigns, social media and community mobilization, taking into account specific audiences and their needs	**PHE**: E-bug education program targeted to engage children; Antibiotic guardian programme - campaign designed to raise awareness of the risks posed by antimicrobial resistance and to change behaviours around antibiotic use; Communications Department support for awareness campaign "Carbon Monoxide Awareness Week" **ERD-ST**: PhD project (Radiation Risk Reduction) - toward the development of effective and evidence-based public health communication to inform of protective preparedness behaviours and actions to take in immediate response to radiation incidents including civil emergencies and deliberate releases
24n	To apply risk information in all its dimensions of vulnerability, capacity and exposure of persons, communities, countries and assets, as well as hazard characteristics, to develop and implement disaster risk reduction policies	**CRCE**: EMETNET **PHE**: Planning assistance provided for National Risk Register of Civil Emergencies, 2015 edition; Antibiotic guardian programme - campaign designed to raise awareness of the risks posed by antimicrobial resistance and to change behaviours around antibiotic use. **ERD-ST**: PANDHUB (Prevention and Management of High Threat Pathogen Incidents in Transport Hubs); PhD project (Radiation Risk Reduction) - toward the development of effective and evidence-based public health communication to inform of protective preparedness behaviours and actions to take in immediate response to radiation incidents including civil emergencies and deliberate releases
24o	To enhance collaboration among people at the local level to disseminate disaster risk information through the involvement of community-based organizations and nongovernmental organizations	**COMAH**: PHE supports multi-agency emergency preparedness and response to incidents at COMAH sites; PHE staff participate in emergency plan exercises and revisions; PHE has prepared internal resources (good practice guidance, maps and site-specific initial reference sheets), and contributed to HSE (Health and Safety Executive)-led consultations on legislation and guidance; Related publications/supporting evidence:Most relevant publication (HSE), contains overview of regime and brief mention of health/PHE role: A guide to the Control of Major Accident Hazards Regulations (COMAH) 2015 - PHE publications: - Legislative developments: the Control of Major Accident Hazard Regulations 2015 - Part 1: COMAH and the role of Public Health England - Part 2: Public health information in COMAH off-site emergency plans - Review of incidents occurring at COMAH sites in England and Wales, January 2009 – June 2011 - Lessons learnt from a COMAH site exercise: A public health trainee's view - A review of Health Protection Agency involvement in incidents occurring at sites regulated under the Control of Major Accident Hazards (COMAH) Regulations D10:D19 **PHE**: Engagement from PHE, via local EPMs and CCDCs, in LRFs and community risk registers; Development of an award scheme in Cornwall and the South West, The Prince of Wales award, for young people engaged in emergency preparedness and response; Development of community flood plans and flood wardens in local communities **CRCE**: Involved with national fire prevention and response work related to high-risk waste sites,

		which comprises national coordination and locally-led multi-agency assessment and mitigation of risks related to waste sites
Priority 2: Strengthening Disaster Risk Governance to manage disaster risk		
27a(i)	To mainstream and integrate disaster risk reduction within and across all sectors and review and promote the coherence and further development, as appropriate, of national and local frameworks of laws, regulations and public policies, which, by defining roles and responsibilities, guide the public and private sectors in addressing disaster risk in publically owned, managed or regulated services and infrastructures	**PHE**: Planning assistance provided for National Risk Register of Civil Emergencies, 2015 edition and collaborative role across HMG and in support local agencies and bodies **ERD-ST**: Pipeline - Widespread dissemination of knowledge and training through the commercialisation of expert research to public, private and voluntary sectors.
27a(ii)	To mainstream and integrate disaster risk reduction within and across all sectors and review and promote the coherence and further development, as appropriate, of national and local frameworks of laws, regulations and public policies, which, by defining roles and responsibilities, guide the public and private sectors in promoting and providing incentives, as relevant, for actions by persons, households, communities and businesses	**PHE**: Category 1 Responder under Civil Contingencies Act (2004). Forms legal basis of PHE National Incident & Emergency Response Plan. Role encourages across local and national organisation frameworks. Work in PHE led by corporate resilience team which is responsible for Emergency Preparedness, Resilience and Response (EPRR) functions at national level. - Public Health Matters blog post describing work **ERD-ST**: REACHING OUT- Demonstration of EU effective large scale threat and crisis management outside the EU
27a(iii)	To mainstream and integrate disaster risk reduction within and across all sectors and review and promote the coherence and further development, as appropriate, of national and local frameworks of laws, regulations and public policies, which, by defining roles and responsibilities, guide the public and private sectors in enhancing relevant mechanisms and initiatives for disaster risk transparency, which may include financial incentives, public awareness-raising and training initiatives, reporting requirements and legal and administrative measures	**PHE**: Category 1 Responder under Civil Contingencies Act (2004). Forms legal basis of PHE National Incident & Emergency Response Plan. Role encourages across local and national organisation frameworks. Work in PHE led by corporate resilience team which is responsible for Emergency Preparedness, Resilience and Response (EPRR) functions at national level. - Public Health Matters blog post describing work **ERD-ST**: PhD project (Radiation Risk Reduction) - toward the development of effective and evidence-based public health communication to inform of protective preparedness behaviours and actions to take in immediate response to radiation incidents including civil emergencies and deliberate releases **Global Public Health**: Priority outlined in PHE Global Health Strategy (2014 to 2019) to "Improving global health security and meeting responsibilities under the International Health Regulations

27a(iv)	To mainstream and integrate disaster risk reduction within and across all sectors and review and promote the coherence and further development, as appropriate, of national and local frameworks of laws, regulations and public policies, which, by defining roles and responsibilities, guide the public and private sectors in putting in place coordination and organizational structures	• **ERD-ST**: REACHING OUT- Demonstration of EU effective large scale threat and crisis management outside the EU and MIDAS - Meaningful Integration of Data Analytics and Services: Development of a big data platform which will manage and model existing healthcare and government data thus informing better long term policy making decision meetings • **PHE**: Category 1 Responder under Civil Contingencies Act (2004). Forms legal basis of PHE National Incident & Emergency Response Plan. Role encourages across local and national organisation frameworks. Work in PHE led by corporate resilience team which is responsible for Emergency Preparedness, Resilience and Response (EPRR) functions at national level. ○ Public Health Matters blog post describing work • **Global Public Health**: Priority outlined in PHE Global Health Strategy (2014 to 2019) to "Improving global health security and meeting responsibilities under the International Health Regulations

27b	To adopt and implement national and local disaster risk reduction strategies and plans, across different timescales, with targets, indicators and time frames, aimed at preventing the creation of risk, the reduction of existing risk and the strengthening of economic, social, health and environmental resilience	• **PHE**: Engaged with completion of and implementation of findings from National Risk Assessment and Local Risk Assessments and category 1 Responder under Civil Contingencies Act (2004). Forms legal basis of PHE National Incident & Emergency Response Plan. Role encourages across local and national organisation frameworks. Work in PHE led by corporate resilience team which is responsible for Emergency Preparedness, Resilience and Response (EPRR) functions at national level.
		   ○ Public Health Matters blog post describing work
		• **ERD**: PHE leads multiagency strategies/plans aimed at reducing risk from cold/hot weather and strengthening social, health and environmental resilience. In particular, alert levels 0 & 1 concern strengthening resilience rather than incident response:
		   ○ Cold Weather Plan for England, including the Annual Cold Weather Plan Seminar, Winter Health Watch and associated public and professional communications and guidance.
		   ○ Heatwave Plan for England, including the Annual Heatwave Plan Seminar and associated public and professional communications and guidance.
		   ○ Partnered with Environment Agency in implementation of National Flood Emergency Framework
		   ○ National Adaptation Plan
		• **ERD-ST**: PANDHUB (Prevention and Management of High Threat Pathogen Incidents in Transport Hubs): Carried out a systematic literature review to build understanding of the use of real-time communication tools during infectious disease outbreaks and disasters in transport hubs and to make recommendations for their future use.
		• **CRCE**: EMETNET (European Multiple Environmental Emergencies Network) is an EU project part funded by DG ECHO (Directorate-General for European Civil Protection and Humanitarian Aid); Note: Strategy for how the Rapid Risk Assessment (RRA); Impact Assessment Scale and Network of Experts will be embedded across UK is yet to be determined to enable UK to meet our strategic commitments to Sendai Framework; Impact Assessment Scale for disasters.
		• **Global Public Health**: Priority outlined in PHE Global Health Strategy (2014 to 2019) to "Improving global health security and meeting responsibilities under the International Health Regulations".

27c	To carry out an assessment of the technical, financial and administrative disaster risk management capacity to deal with the identified risks at the local and national levels	**EPRR**: Local risks: Local resilience through LRFs and community risk registers and national risks: Identification of priority risks under National Risk Assessment. Ensure plans in place to cover high priority health risks in the NRA. **ERD-ST**: REACHING OUT- Demonstration of EU effective large scale threat and crisis management outside the EU **CRCE**: Involved with national fire prevention and response work related to high-risk waste sites, which comprises national coordination and locally-led multi-agency assessment and mitigation of risks related to waste sites
27d	To encourage the establishment of necessary mechanisms and incentives to ensure high levels of compliance with the existing safety-enhancing provisions of sectoral laws and regulations, including those addressing land use and urban planning, building codes, environmental and resource management and health and safety standards, and update them, where needed, to ensure an adequate focus on disaster risk management	
27e	To develop and strengthen, as appropriate, mechanisms to follow up, periodically assess and publicly report on progress on national and local plans; and promote public scrutiny and encourage institutional debates, including by parliamentarians and other relevant officials, on progress reports of local and national plans for disaster risk reduction	**PHE**: Assistance provided for Parliamentary Select Committee on "Science in emergencies: UK lessons from Ebola inquiry".
27f	To assign, as appropriate, clear roles and tasks to community representatives within disaster risk management institutions and processes and decision-making through relevant legal frameworks, and undertake comprehensive public and community consultations during the development of such laws and regulations to support their implementation	**CRCE**: Community engagement ensured in national plans; Cold Weather Plan for England, including the Annual Cold Weather Plan Seminar, Winter Health Watch and associated public and professional communications and guidance; Heatwave Plan for England, including the Annual Heatwave Plan Seminar and associated public and professional communications and guidance; National Flood Emergency Framework

27g	To establish and strengthen government coordination forums composed of relevant stakeholders at the national and local levels, such as national and local platforms for disaster risk reduction, and a designated national focal point for implementing the Sendai Framework for Disaster Risk Reduction 2015–2030. It is necessary for such mechanisms to have a strong foundation in national institutional frameworks with clearly assigned responsibilities and authority to, inter alia, identify sectoral and multisectoral disaster risk, build awareness and knowledge of disaster risk through sharing and dissemination of non-sensitive disaster risk information and data, contribute to and coordinate reports on local and national disaster risk, coordinate public awareness campaigns on disaster risk, facilitate and support local multisectoral cooperation (eg among local governments) and contribute to the determination of and reporting on national and local disaster risk management plans and all policies relevant for disaster risk management. These responsibilities should be established through laws, regulations, standards and procedures	• **PHE**: Planning assistance provided for National Risk Register of Civil Emergencies, 2015 edition; Links to Local Resilience For a; Collaborates with the Institute for Health Metrics and Evaluation on the Global Burden of Disease programme. It includes the modelling of the disease burden due to "Forces of nature, war and legal interventions". Global Burden of Disease visualization application; Category 1 Responder under Civil Contingencies Act (2004). Forms legal basis of PHE National Incident & Emergency Response Plan. Role encourages across local and national organisation frameworks. Work in PHE led by corporate resilience team which is responsible for Emergency Preparedness, Resilience and Response (EPRR) functions at national level. o Public Health Matters blog post describing work • **EPRR**: Reports from National Situational Awareness Cell (NSAC) • **ERD-ST**: REACHING OUT- Demonstration of EU effective large scale threat and crisis management outside the EU • **CRCE**: EMETNET (European Multiple Environmental Emergencies Network) is an EU project part funded by DG ECHO (Directorate-General for European Civil Protection and Humanitarian Aid). o Note: Strategy for how the Rapid Risk Assessment (RRA); Impact Assessment Scale and Network of Experts will be embedded across UK is yet to be determined to enable UK to meet our strategic commitments to Sendai Framework. o Impact Assessment Scale for natural or manmade disasters. o Network of experts for environmental emergencies, disasters and crises. • **Global Public Health**: Priority outlined in PHE Global Health Strategy (2014 to 2019) to "Improving global health security and meeting responsibilities under the International Health Regulations • **GDRR**: Engaged with international expert events across a number of roles including: representation, organisation, deliberation activities and output process. Events included - Global Platform for Disaster Risk Reduction (Mexico, May 2017), European Forum for Disaster Risk Reduction (Turkey, March 2017), and Loss Data workshop on Sendai Indicators approved by UN General Assembly.
27h	To empower local authorities, as appropriate, through regulatory and financial means to work and coordinate with civil society, communities and indigenous peoples and migrants in disaster risk management at the local level	
27i	To encourage parliamentarians to support the implementation of disaster risk reduction by developing new or amending relevant legislation and setting budget allocations	
27j	To promote the development of quality standards, such as certifications and awards	• **ERD ST**: REACHING OUT- Demonstration of EU effective large scale threat and crisis management outside the EU, MIDAS - Meaningful Integration of Data Analytics and Services: Development of a

	for disaster risk management, with the participation of the private sector, civil society, professional associations, scientific organizations and the United Nations	big data platform which will manage and model existing healthcare and government data thus informing better long term policy making decision meetings
		
		• **GDRR**: Engagement with and support provided for a number of organisations aiming to ensure quality standards, especially with respect to information. These include:
		    o UK Alliance for Disaster Research (UKADR)
		    o Scientific and Technical Advisory Group (STAG) for United Nations Office for Disaster Risk Reduction (UNISDR)
		        ▪ GDRR Consultant performing role of Vice-Chair (2008 – 2017).
		        ▪ "The purpose of the STAG is to provide technical advice and support in the formulation and implementation of activities carried out by the disaster risk reduction community. The work of the STAG encompasses all aspects of the scientific and technical dimensions of risk reduction, with particular emphasis on the needs of developing countries."
		    o Integrated Research on Disaster Risk (IRDR)
		        ▪ GDRR Consultant member of scientific committee
		        ▪ "Integrated Research on Disaster Risk (IRDR) is a decade-long, interdisciplinary research programme sponsored by ICSU in partnership with the International Social Science Council (ISSC), and the United Nations International Strategy for Disaster Reduction (UN-ISDR). It is a global initiative seeking to address the challenges brought by natural hazard events, mitigate their impacts, and improve related policy-making mechanisms."
		    o CODATA
		        ▪ "CODATA is the Committee on Data of the International Council for Science (ICSU). CODATA exists to promote global collaboration to improve the availability and usability of data for all areas of research. CODATA supports the principle that research data should be as open as possible and as closed as necessary. By promoting the policy, technological and cultural changes that are essential to make research data more widely available, CODATA helps advance ICSU's mission of strengthening international science for the benefit of society." The Linked Open Data for Global Disaster Risk Research (LODGD) is the CODATA task group to study the mechanism for connecting such data to enable easier and faster discovery and access - GDRR Consultant is co-chair of LODGD.

27k	To formulate public policies, where applicable, aimed at addressing the issues of prevention or relocation, where possible, of human settlements in disaster risk-prone zones, subject to national law and legal systems	

Priority 3: Investing in disaster risk reduction for resilience		
30a	To allocate the necessary resources, including finance and logistics, as appropriate, at all levels of administration for the development and the implementation of disaster risk reduction strategies, policies, plans, laws and regulations in all relevant sectors	• **Global Public Health**: Delivery on all points outlined in PHE Global Health Strategy (2014 to 2019) - "Improving global health security and meeting responsibilities under the International Health Regulations
30b	To promote mechanisms for disaster risk transfer and insurance, risk-sharing and retention and financial protection, as appropriate, for both public and private investment in order to reduce the financial impact of disasters on Governments and societies, in urban and rural areas	
30c	To strengthen, as appropriate, disaster-resilient public and private investments, particularly through structural, non-structural and functional disaster risk prevention and reduction measures in critical facilities, in particular schools and hospitals and physical infrastructures; building better from the start to withstand hazards through proper design and construction, including the use of the principles of universal design and the standardization of building materials; retrofitting and rebuilding; nurturing a culture of maintenance; and taking into account economic, social, structural, technological and environmental impact assessments	• **PHE**: PHE has announced that it plans to build a £400 million world-leading home for public health science in Harlow. PHE will create a centre of excellence for research, health improvement and protection and bring together world-renowned scientists working to protect and improve the health of the nation.
30d	To protect or support the protection of cultural and collecting institutions and other sites of historical, cultural heritage and religious interest	• **PHE**: PHE is increasingly focusing on Arts for health and wellbeing and has published an evaluation framework in 2016 and has participated in the Culture, Health and Wellbeing International Conference 2017 addressing Arts and Global Disasters • **GDRR**: participated in the InterAcademy Partnership 2016 International Conference Florence 1966-2016 Resilience of Art Cities to Natural Catastrophes: the role of Academies and presented on Cultural heritage, science and technology and the Sendai Framework for Disaster Risk Reduction 2015-2030.

| 30e | To promote the disaster risk resilience of workplaces through structural and non-structural measures | **PHE**: Published guidance to increase climate resilience of the healthcare estate (Health Building Note: HBN 00-07, April 2014) and to make energy work in healthcare (Health Technical Memorandum: HTM 07-02, March 2015). **ERD**: Flooding e-learning module for PHE, NHS and MoD (clinical) staff and sustainability e-learning module **ERD & CRCE**: Off the Shelf Cold Weather Exercise and off the Shelf Heatwave Exercise (forthcoming). **COMAH**: PHE supports multi-agency emergency preparedness and response to incidents at COMAH sites; PHE staff participate in emergency plan exercises and revisions; PHE has prepared internal resources (good practice guidance, maps and site-specific initial reference sheets), and contributed to HSE-led consultations on legislation and guidance. Related publications/supporting evidence: Most relevant publication (HSE), contains overview of regime and brief mention of health/PHE role: A guide to the Control of Major Accident Hazards Regulations (COMAH) 2015 PHE publications: Legislative developments: the Control of Major Accident Hazard Regulations 2015 Part 1: COMAH and the role of Public Health England Part 2: Public health information in COMAH off-site emergency plans Review of incidents occurring at COMAH sites in England and Wales, January 2009 – June 2011 Lessons learnt from a COMAH site exercise: A public health trainee's view A review of Health Protection Agency involvement in incidents occurring at sites regulated under the Control of Major Accident Hazards (COMAH) Regulations D10:D19 |
| 30f | To promote the mainstreaming of disaster risk assessments into land-use policy development and implementation, including urban planning, land degradation assessments and informal and non-permanent housing, and the use of guidelines and follow-up tools informed by anticipated demographic and environmental changes | **CRCE**: National Adaptation Plan - Working on projects consistent with delivering aims. |

30g	To promote the mainstreaming of disaster risk assessment, mapping and management into rural development planning and management of, inter alia, mountains, rivers, coastal flood plain areas, drylands, wetlands and all other areas prone to droughts and flooding, including through the identification of areas that are safe for human settlement, and at the same time preserving ecosystem functions that help to reduce risks	• **CRCE**: National Adaptation Programme: - National Adaptation Programme includes utility work for blue and green infrastructure in implementation strategies; Cold Weather Plan for England, including the Annual Cold Weather Plan Seminar, Winter Health Watch and associated public and professional communications and guidance; Heatwave Plan for England, including the Annual Heatwave Plan Seminar and associated public and professional communications and guidance and the National Flood Emergency Framework
30h	To encourage the revision of existing or the development of new building codes and standards and rehabilitation and reconstruction practices at the national or local levels, as appropriate, with the aim of making them more applicable within the local context, particularly in informal and marginal human settlements, and reinforce the capacity to implement, survey and enforce such codes through an appropriate approach, with a view to fostering disaster-resistant structures	• **PHE**: Published guidance to increase climate resilience of the healthcare estate (Health Building Note: HBN 00-07, April 2014) and to make energy work in healthcare (Health Technical Memorandum: HTM 07-02, March 2015); Membership of the Cross-government overheating group; Engagement with UK Climate Change Risk Assessment 2017; Health Protection Research Unit in Environmental Change and Health (HPRU ECH) o "We will help Public Health England (PHE) to fulfil its requirements under the National Adaptation Programme and other policies on sustainable development. The HPRU will also produce research of relevance to other government departments regarding the health co-benefits of environmental policies." o Publications, example "Evaluation of the impact on community morbidity and healthcare usage associated with Heatwaves using real-time syndromic surveillance". o National Adaptation Plan • **CRCE COMAH**: PHE supports multi-agency emergency preparedness and response to incidents at COMAH sites o PHE staff participate in emergency plan exercises and revisions o PHE has prepared internal resources (good practice guidance, maps and site-specific initial reference sheets), and contributed to HSE-led consultations on legislation and guidance. Related publications/supporting evidence: ▪ Most relevant publication (HSE), contains overview of regime and brief mention of health/PHE role: ▪ A guide to the Control of Major Accident Hazards Regulations (COMAH) 2015 ▪ PHE publications: ▪ Legislative developments: the Control of Major Accident Hazard Regulations 2015 ▪ Part 1: COMAH and the role of Public Health England ▪ Part 2: Public health information in COMAH off-site emergency plans ▪ Review of incidents occurring at COMAH sites in England and Wales, January 2009 – June 2011 ▪ Lessons learnt from a COMAH site exercise: A public health trainee's view ▪ A review of Health Protection Agency involvement in incidents occurring at sites regulated under the Control of Major Accident Hazards (COMAH) Regulations D10:D19

		• **Heatwave Plan for England**, including the Annual Heatwave Plan Seminar and associated public and professional communications and guidance.
30i	To enhance the resilience of national health systems, including by integrating disaster risk management into primary, secondary and tertiary health care, especially at the local level; developing the capacity of health workers in understanding disaster risk and applying and implementing disaster risk reduction approaches in health work; promoting and enhancing the training capacities in the field of disaster medicine; and supporting and training community health groups in disaster risk reduction approaches in health programmes, in collaboration with other sectors, as well as in the implementation of the International Health Regulations (2005) of the World Health Organization	• **PHE**: Field Epidemiology Training Programme (FETP) - The 2 year programme is aimed at medical, nursing, scientific, or veterinary staff who are, or whose future career may be, in a post involving field investigation and epidemiology and who want to further enhance their specialist skills. The programme provides training and experience to develop the competencies agreed for field epidemiologists in the European Union (EU). ○ Trainers = FETP Fellows. ○ Programme is part of RST engagement through IHR work going forwards. ○ Aims: Evaluate surveillance systems and help strengthen surveillance systems through recommendations, based on programme of teaching, training and outbreak investigation. Aim to aid those in other countries through teaching and training from those who graduate the programme. Has remit at local, national, regional and global levels. ○ Benefits: Utility to collect human resources in organisation. ○ Focus: Surveys in areas with disasters (including focus on mortality, morbidity, vax coverage, nutrition). Conduct applied research with view to quick implementation to guidance/changes in policy. Cover ALL hazards, competencies including in programme are comprehensive (found on website). • **CBRN** – Gudiance on Chemical and Radiation Incidents Factsheet: LHRPs PHE works closely with Local Health Resilience Partnerships at LRF level on disaster risk management in health service areas including training and policy development., • **EPRR**: Engagement/Meetings: Daily NSAC report, Weekly at operational level (Tuesday call), Monthly of delivery group (operational element of EPRR), Quarterly at strategic level (oversight group - strategic element of EPRR) and part of enhancing resilience also comes from EPRR policy leads forum - UK wide. • **ERD/CRCE**: Selection of Off The Shelf Exercises (OTSE) available, all are designed for health concerns in an English setting, but with an element of multi-agency engagement. Current OTSE titles include: Business Continuity, Chemical Hazmat, Burns, Communicable Disease, Hospital Evacuation, Pandemic Influenza, Viral Haemorrhagic Fever, Winter Pressures and Mass Casualty. Further OTSE are currently under development including Heat Wave, Fuel Disruption and Nursing Home Evacuation. ○ July 2016 Flyer for OTSE ○ Production of Pandemic Influenza Response Plan ○ Flooding e-learning module for PHE, NHS and MoD (clinical) staff

| | | o Sustainability e-learning module o Off the Shelf Cold Weather Exercise o Off the Shelf Heatwave Exercise (forthcoming). o Cold Weather Plan for England o Heatwave Plan for England o National Flood Emergency Framework
• **ERD-ST**: REACHING OUT- Demonstration of EU effective large scale threat and crisis management outside the EU; WHO EBOLA - Investigation into the well-being of humanitarian workers in during and following overseas and local deployments to aid in disaster relief based on support systems such as organisational and mental health support. Includes recommendations as to best practice in supporting psychosocial well-being of deployed personnel.
• **CKO**: Annual Review of Research includes several case studies relevant to DRR as well as linking to each HPRU; National Infection Service (NIS): o Exists to protect and improve nation's health from infectious disease and reduce health inequalities arising from the burden of infectious disease. o Methods of assistance include: surveillance, support provided to NHS, provision of bulletins, supporting resilience and response. • Health Protection Research Unit in Environmental Change and Health (NIHR-ECH)programmes of work including: o Flooding and Healthcare resilience: Aims to assess the impact upon health services and infrastructure associated with the December 2013 east coast storm surge (forthcoming publication). o Social and Political dynamics of flood risk, recovery and response. o Evaluation of morbidity and healthcare usage associated with Heatwaves. o Climate Change Adaptation Reporting Powers |
| 30j | To strengthen the design and implementation of inclusive policies and social safety-net mechanisms, including through community involvement, integrated with livelihood enhancement programmes, and access to basic health-care services, including maternal, newborn and child health, sexual and reproductive health, food security and nutrition, housing and education, towards the eradication of poverty, to find durable solutions in the post-disaster phase and to empower and assist people disproportionately affected by disasters | • **CRCE**: Cold Weather Plan for England, including the Annual Cold Weather Plan Seminar, Winter Health Watch and associated public and professional communications and guidance and community flood plans and flood warden schemes |

30k	People with life-threatening and chronic disease, due to their particular needs, should be included in the design of policies and plans to manage their risks before, during and after disasters, including having access to life-saving services	• **NIS**: The National Study of Flooding and Health: Cohort study established by PHE in collaboration with partners following severe storms and floods in the winter of 2013/14 to improve our understanding of the impact of flooding on health with the aim of reducing the risks to public health and strengthening the response to future flooding events. Study included investigations into disruptive effects and guidance documents include information on long standing conditions and health seeking behaviour • **HPRU:** Public engagement strategy and is engaged with the HEPE Group; Research Production: Health Protection Research Unit(in Environmental Change and Health (HPRU ECH) 　o Numerous Publications, example Evaluation of the impact on community morbidity and healthcare usage associated with Heatwaves using real-time syndromic surveillance. 　o Fulfil requirements under the National Adaptation Programme and other policies on sustainable development. The HPRU will also produce research of relevance to other government departments regarding the health co-benefits of environmental policies." • **ERD:** Research on medications and evacuations: 　o Disaster-Driven Evacuation and Medication Loss: a Systematic Literature Review 　o Medication supply for people evacuated during disasters.
30l	To encourage the adoption of policies and programmes addressing disaster-induced human mobility to strengthen the resilience of affected people and that of host communities, in accordance with national laws and circumstances	• **TMHS**: PHE travel and migrant health team supports migration team in home office; Published Migrant Health Guide; Recent event responses engaged: 　o Ebola in West Africa 　o Chikungunya in the Caribbean 　o Avian influenza 　o Middle East respiratory syndrome coronavirus (MERS-CoV) 　o Commissions NathNAC: Advice line is for health professionals who have queries about travel scenarios that involve either complex itineraries or travellers with special health needs. Seek to improve the quality of travel health advice given by GP practices, travel clinics, pharmacies and other healthcare providers, and provide up-to-date and reliable information for the traveller, travel industry and national government; Commissioned by Public Health England and hosted by University College London Hospitals NHS Foundation Trust (UCLH); we also work in partnership with our other network founders Liverpool School of Tropical Medicine (LSTM), London School of Hygiene and Tropical Medicine (LSHTM) and the Hospital for Tropical Diseases (HTD). • **ERD-ST:** REACHING OUT- Demonstration of EU effective large scale threat and crisis management outside the EU
30m	To promote, as appropriate, the integration of disaster risk reduction considerations and measures in financial and fiscal instruments	• **CRCE:** Cold Weather Plan for England, including the Annual Cold Weather Plan Seminar, Winter Health Watch and associated public and professional communications and guidance: Support "Keep Warm, Keep Well" campaign

30n	To strengthen the sustainable use and management of ecosystems and implement integrated environmental and natural resource management approaches that incorporate disaster risk reduction	• **ERD:** Medical entomology and zoonoses ecology (MEZE)(Part of ERD)
		  o MEZE undertake worldwide Horizon Scanning to develop an understanding of global emerging infectious disease (EID) issues to enable an assessment of their likely threat to the UK, and to identify current knowledge and information gaps to help direct and inform qualitative and quantitative approaches to microbial risk assessments. This also involves carrying out qualitative and quantitative risk assessments on new, emerging and re-emerging infectious diseases threats to the UK ahead-of-time, through collaboration and consultation with both academic and cross- governmental groups; Sample publications:
		    ▪ Enhanced West Nile virus surveillance in the North Kent marshes, UK,
		    ▪ Colonization of a newly constructed urban wetland by mosquitoes in England: implications for nuisance and vector species.

30o	To increase business resilience and protection of livelihoods and productive assets throughout the supply chains, ensure continuity of services and integrate disaster risk management into business models and practices	• **CRCE COMAH**: PHE supports multi-agency emergency preparedness and response to incidents at COMAH sites:
		  o PHE staff participate in emergency plan exercises and revisions
		  o PHE has prepared internal resources (good practice guidance, maps and site-specific initial reference sheets), and contributed to HSE-led consultations on legislation and guidance.
		  o Related publications/supporting evidence:
		    ▪ Most relevant publication (HSE), contains overview of regime and brief mention of health/PHE role:
		      • A guide to the Control of Major Accident Hazards Regulations (COMAH) 2015
		    ▪ PHE publications:
		      • Legislative developments: the Control of Major Accident Hazard Regulations 2015
		      • Part 1: COMAH and the role of Public Health England
		      • Part 2: Public health information in COMAH off-site emergency plans
		      • Review of incidents occurring at COMAH sites in England and Wales, January 2009 – June 2011
		      • Lessons learnt from a COMAH site exercise: A public health trainee's view
		      • A review of Health Protection Agency involvement in incidents occurring at sites regulated under the Control of Major Accident Hazards (COMAH) Regulations D10:D19
		• **ERD**: Business Continuity Management System for PHE (but is organisation specific, complies with requirements of Sendai); Includes Business Impact Analysis (BIA) tool as part of business continuity management programme.

30p	To strengthen the protection of livelihoods and productive assets, including livestock, working animals, tools and seeds	- ERD ST: Medical Entomology and Zoonoses Ecology (MEZE) - MEZE undertake worldwide Horizon Scanning to: develop an understanding of global emerging infectious disease (EID) issues to assess their threat to the UK identify current knowledge and information gaps to help direct and inform qualitative and quantitative approaches to relevant risk assessments carry out qualitative and quantitative risk assessments on new, emerging and re-emerging infectious diseases that pose threats to the UK ahead-of-time, through collaboration and consultation with both academic and cross-governmental groups. - Membership of the Human Animal Infections Risk Surveillance (HAIRS) group which inputs into DH's National Expert Panel on New and Emerging Infections (NEPNEI). - Includes risk assessments on emerging tick-borne bacteria in the UK, squirrel Bornavirus, Zika virus, hantavirus, Chikungunya virus, Mycobacterium bovis in cats, HAIRS risk assessment: marine mammal Brucella species, Implementation of One Health program concerned with infectious diseases movement from animals to humans. - HAIRS Report 2013-2015
30q	To promote and integrate disaster risk management approaches throughout the tourism industry, given the often heavy reliance on tourism as a key economic driver	**Commission NathNAC**: - Advice line is for health professionals who have queries about travel scenarios that involve either complex itineraries or travellers with special health needs. Seek to improve the quality of travel health advice given by GP practices, travel clinics, pharmacies and other healthcare providers, and provide up-to-date and reliable information for the traveller, travel industry and national government. - Commissioned by Public Health England and hosted by UCLH; we also work in partnership with our other network founders Liverpool School of Tropical Medicine (LSTM), London School of Hygiene and Tropical Medicine (LSHTM) and the Hospital for Tropical Diseases (HTD).
Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction		
33a	To prepare or review and periodically update disaster preparedness and contingency policies, plans and programmes with the involvement of the relevant institutions, considering climate change scenarios and their impact on disaster risk, and facilitating, as appropriate, the participation of all sectors and relevant stakeholders	**EPRR**: Sharing experiences, off shelf exercises with LRFs during Ebola, shared lessons from exercises (eg Exercise Cygnus, National Situational Awareness Cell). Coordination of national and local incident response plans. Face-to-face training courses include Emergo, Loggists' courses and STAC (Scientific and Technical Advisory Committee) Chair training. E-learning modules covering a wide range of topics.

33b	To invest in, develop, maintain and strengthen people-centred multi-hazard, multisectoral forecasting and early warning systems, disaster risk and emergency communications mechanisms, social technologies and hazard-monitoring telecommunications systems; develop such systems through a participatory process; tailor them to the needs of users, including social and cultural requirements, in particular gender; promote the application of simple and low-cost early warning equipment and facilities; and broaden release channels for natural disaster early warning information	• **EPRR**: PHE contribute to process of this via publishing of timely guidance for health professionals and the public. Prior to disaster, and during disaster event itself; Situational awareness and altering mechanisms; Guidance for disease outbreaks of concern (ie Zika type info) • **ERD ST:** PANDHUB (Prevention and Management of High Threat Pathogen Incidents in Transport Hubs): Carried out a systematic literature review to build understanding of the use of real-time communication tools during infectious disease outbreaks and disasters in transport hubs and to make recommendations for their future use and PhD project (Radiation Risk Reduction) - toward the development of effective and evidence-based public health communication to inform of protective preparedness behaviours and actions to take in immediate response to radiation incidents including civil emergencies and deliberate releases

33c	To promote the resilience of new and existing critical infrastructure, including water, transportation and telecommunications infrastructure, educational facilities, hospitals and other health facilities, to ensure that they remain safe, effective and operational during and after disasters in order to provide live-saving and essential services	• **CRCE:** Recovery Handbooks: PHE has developed guidance handbooks which can be used in the remediation and recovery phase following a biological, chemical or radiation incident. To complement the handbooks, interactive support tools (for chemical and radiation incidents) have been developed to help with the decision-making process for developing a recovery strategy.
		   o Guidance and templates for recording and reporting decisions on recovery are also available.
		   o These resources are for evaluating recovery options (remediation techniques) that are likely to be the most appropriate, applicable and effective on a site- and incident-specific basis:
		      ▪ chemical recovery navigation tool
		      ▪ chemical recovery record form
		      ▪ radiation recovery navigation tool (Inhabited areas; Food; Drinking water)
		      ▪ radiation recovery record form
		      ▪ e-learning module: principles of recovery and remediation
		      ▪ guidance on recovery after a chemical, biological or radiation (CBRN) incident, including HazMat
		• **ERD ST:** Phoenix - Working with UK wide fire services to carry out human volunteer trials to determine a best method of interim decontamination in the event of a CBRN incident. Testing and development of mass casualty decontamination procedures and making recommendations on the basis of evidence based findings; Carrying out work in line with EPR HPRU Theme 5 falls under the remit of this statement - Improving the operational effectiveness and perceived public acceptability of decontamination interventions, through in vitro experiments, focus groups studies, and human volunteer field trials

33d	To establish community centres for the promotion of public awareness and the stockpiling of necessary materials to implement rescue and relief activities	• **PHE**: Medicines Management Group: Under group remit: The Group will consider all medicines management issues relating to PHE including procurement, storage, distribution, prescribing, advice, supply, administration and disposal of medicines for human use including first aid supplies, stockpiles of medicines held on behalf of other organisations, such the Department of Health, and medicines used by the occupational health services; Work includes stockpiling for emergency medications, vaccines, antidotes + antivenoms as required; CRCE commissions National Poisons Information Service

33e	To adopt public policies and actions that support the role of public service workers to establish or strengthen coordination and funding mechanisms and procedures for relief assistance and plan and prepare for post-disaster recovery and reconstruction	• **CRCE**: Recovery Handbooks: PHE has developed guidance handbooks which can be used in the remediation and recovery phase following a biological, chemical or radiation incident; The UK Recovery Handbooks provide practical guidance for the remediation of the environment following a CBR incident. The DRT will provide evidence based guidance (decision makers and community level action) for the recovery and remediation of the environment following both natural or manmade disaster and crises. UK Recovery Handbooks and the DRT seek to minimise exposure of the public, reduce the impact of an incident and improve resilience to CBR incidents and natural or man-made disaster and crises; To complement the handbooks, interactive support tools (for chemical and radiation incidents) have been developed to help with the decision-making process for developing a recovery strategy; Guidance and templates for recording and reporting decisions on recovery are also available; These resources are for evaluating recovery options (remediation techniques) that are likely to be the most appropriate, applicable and effective on a site- and incident-specific basis:
		  o chemical recovery navigation tool
		  o chemical recovery record form
		  o radiation recovery navigation tool (Inhabited areas; Food; Drinking water)
		  o radiation recovery record form
		  o e-learning module: principles of recovery and remediation
		  o guidance on recovery after a chemical, biological or radiation (CBRN) incident, including HazMat
		• **ERD ST:** Pipeline - Widespread dissemination of knowledge and training through the commercialisation of expert research to public, private and voluntary sectors.

33f	To train the existing workforce and voluntary workers in disaster response and strengthen technical and logistical capacities to ensure better response in emergencies	• **EPRR:** PHE training and exercise program (note only for PHE staff). • **CRCE**: CBRN Recovery Handbooks: PHE has developed guidance handbooks which can be used in the remediation and recovery phase following a biological, chemical or radiation incident; The UK Recovery Handbooks provide practical guidance for the remediation of the environment following a CBR incident. The DRT will provide evidence based guidance (decision makers and community level action) for the recovery and remediation of the environment following both natural or manmade disaster and crises. UK Recovery Handbooks and the DRT seek to minimise exposure of the public, reduce the impact of an incident and improve resilience to CBR incidents and natural or man-made disaster and crises; develops and delivers local, regional and national training related to chemical emergency preparedness and response to emergency responders and other organisations (eg,

		HAZMED courses for paramedics) • REACHING OUT project - Horizon 2020 funded project, working with EU MS partners who are developing tools for use Internationally (ie Africa, Israel, Asia) However, the strategy for how these tools are embedded across UK (ie Disaster Recovery Tool (DRT)/ Psychological first aid tool/ Audio Visual Assessment Tool (AVA) is yet to be determined on how they will contribute to us (UK) in meeting strategic commitments to the Sendai Framework. The Disaster Recovery Tool (DRT) will provide evidence based guidance (decision makers and community level action) for the recovery and remediation of the environment following both natural or manmade disasters and crises. How information is accessed is also being investigated; it is likely that information will be provided by SMS, IVR, web application (HTML) and as a printed hard copy (back-up). • **ERD ST:** REACHING OUT- Demonstration of EU effective large scale threat and crisis management outside the EU; Pipeline - Widespread dissemination of knowledge and training through the commercialisation of expert research to public, private and voluntary sectors.
33g	To ensure the continuity of operations and planning, including social and economic recovery, and the provision of basic services in the post-disaster phase	• **ERD**: Business Continuity Management System for PHE (but is organisation specific, complies with requirements of Sendai); Includes Business Impact Analysis (BIA) tool as part of business continuity management programme.

33h	To promote regular disaster preparedness, response and recovery exercises, including evacuation drills, training and the establishment of area-based support systems, with a view to ensuring rapid and effective response to disasters and related displacement, including access to safe shelter, essential food and non-food relief supplies, as appropriate to local needs	• **CRCE:** CBRN Recovery Handbooks: PHE has developed guidance handbooks which can be used in the remediation and recovery phase following a biological, chemical or radiation incident. The UK Recovery Handbooks provide practical guidance for the remediation of the environment following a CBR incident. The DRT will provide evidence based guidance (decision makers and community level action) for the recovery and remediation of the environment following both natural or manmade disaster and crises. UK Recovery Handbooks and the DRT seek to minimise exposure of the public, reduce the impact of an incident and improve resilience to CBR incidents and natural or man-made disaster and crises. To complement the handbooks, interactive support tools (for chemical and radiation incidents) have been developed to help with the decision-making process for developing a recovery strategy.
		    o Guidance and templates for recording and reporting decisions on recovery are also available.
		    o These resources are for evaluating recovery options (remediation techniques) that are likely to be the most appropriate, applicable and effective on a site- and incident-specific basis:
		        ▪ chemical recovery navigation tool
		        ▪ chemical recovery record form
		        ▪ radiation recovery navigation tool (Inhabited areas; Food; Drinking water)
		        ▪ radiation recovery record form
		        ▪ e-learning module: principles of recovery and remediation
		        ▪ guidance on recovery after a chemical, biological or radiation (CBRN) incident, including HazMat
		• **ERD**: Selection of Off The Shelf Exercises (OTSE) available, all are designed for health concerns in

		an English setting, but with an element of multi-agency engagement. Current OTSE titles include: Business Continuity, Chemical Hazmat, Burns, Communicable Disease, Hospital Evacuation, Pandemic Influenza, Viral Haemorrhagic Fever, Winter Pressures and Mass Casualty. Further OTSE are currently under development including Heat Wave, Fuel Disruption and Nursing Home Evacuation.
		      ▪ July 2016 Flyer for OTSE
		  o Carrying out work EPR HPRU Theme 7 falls under the remit of this statement (Enhancing emergency preparedness through improved exercises and training)
		  o REACHING OUT- Demonstration of EU effective large scale threat and crisis management outside the EU

33i	To promote the cooperation of diverse institutions, multiple authorities and related stakeholders at all levels, including affected communities and business, in view of the complex and costly nature of post-disaster reconstruction, under the coordination of national authorities	• **PHE**: Local efforts are led by local authorities and PHE then feeds inputs into work
		  o Institutional engagement:
		    ▪ National Incident & Emergency Response Plan includes measures to ensure support work programme and evidence based decision making. Provision of expertise to: Scientific Advisory Group for Emergencies (SAGE) and National Security Council (Threats, Hazards, Resilience and Contingencies) (sometimes referred to as COBR).
		  o Resilience assistance via establishment of operational support cells by incident management team (IMT).
		• **ERD ST:** REACHING OUT- Demonstration of EU effective large scale threat and crisis management outside the EU

33j	To promote the incorporation of disaster risk management into post-disaster recovery and rehabilitation processes, facilitate the link between relief, rehabilitation and development, use opportunities during the recovery phase to develop capacities that reduce disaster risk in the short, medium and long term, including through the development of measures such as land-use planning, structural standards improvement and the sharing of expertise, knowledge, post-disaster reviews and lessons learned and integrate post-disaster reconstruction into the economic and social sustainable development of affected areas. This should also apply to temporary settlements for persons displaced by disasters	• **NIHR**: Health Protection Research Unit (HPRUs), Outputs include open-access journals. Data sets also available; NIHR HPRU in Emergency Preparedness and Response is led by King's College London, in partnership with Public Health England, the University of East Anglia and Newcastle University.
		• **CRCE:** CBRN Recovery Handbooks: PHE has developed guidance handbooks which can be used in the remediation and recovery phase following a biological, chemical or radiation incident. The UK Recovery Handbooks provide practical guidance for the remediation of the environment following a CBR incident. The DRT will provide evidence based guidance (decision makers and community level action) for the recovery and remediation of the environment following either natural or manmade disaster and crises. UK Recovery Handbooks and the DRT seek to minimise exposure of the public, reduce the impact of an incident and improve resilience to CBR incidents and natural or man-made disaster and crises.
		• To complement the handbooks, interactive support tools (for chemical and radiation incidents) have been developed to help with the decision-making process for developing a recovery strategy.
		  o Guidance and templates for recording and reporting decisions on recovery are also available.
		  o These resources are for evaluating recovery options (remediation techniques) that are likely to be the most appropriate, applicable and effective on a site- and incident-specific basis:

		- chemical recovery navigation tool - chemical recovery record form - radiation recovery navigation tool (Inhabited areas; Food; Drinking water) - radiation recovery record form - e-learning module: principles of recovery and remediation - guidance on recovery after a chemical, biological or radiation (CBRN) incident, including HazMat **ERD ST:** REACHING OUT- Demonstration of effective large scale threat and crisis management outside the EU
33k	To develop guidance for preparedness for disaster reconstruction, such as on land-use planning and structural standards improvement, including by learning from the recovery and reconstruction programmes over the decade since the adoption of the Hyogo Framework for Action, and exchanging experiences, knowledge and lessons learned	**CRCE COMAH**: PHE supports multi-agency emergency preparedness and response to incidents at COMAH sites; PHE staff participate in emergency plan exercises and revisions; PHE has prepared internal resources (good practice guidance, maps and site-specific initial reference sheets), and contributed to HSE-led consultations on legislation and guidance. Related publications/supporting evidence: - Most relevant publication (HSE), contains overview of regime and brief mention of health/PHE role: - A guide to the Control of Major Accident Hazards Regulations (COMAH) 2015 - PHE publications: - Legislative developments: the Control of Major Accident Hazard Regulations 2015 - Part 1: COMAH and the role of Public Health England - Part 2: Public health information in COMAH off-site emergency plans - Review of incidents occurring at COMAH sites in England and Wales, January 2009 – June 2011 - Lessons learnt from a COMAH site exercise: A public health trainee's view - A review of Health Protection Agency involvement in incidents occurring at sites regulated under the Control of Major Accident Hazards (COMAH) Regulations D10:D19 - Involved with national fire prevention and response work related to high-risk waste sites, which comprises national coordination and locally-led multi-agency assessment and mitigation of risks related to waste sites
33l	To consider the relocation of public facilities and infrastructures to areas outside the risk range, wherever possible, in the post-disaster reconstruction process, in consultation with the people concerned, as appropriate	**CRCE COMAH:** PHE supports multi-agency emergency preparedness and response to incidents at COMAH sites. PHE staff participate in emergency plan exercises and revisions. PHE has prepared internal resources (good practice guidance, maps and site-specific initial reference sheets), and contributed to HSE-led consultations on legislation and guidance. Related publications/supporting evidence: - Most relevant publication (HSE), contains overview of regime and brief mention of health/PHE role: - A guide to the Control of Major Accident Hazards Regulations (COMAH) 2015

		o PHE publications: ▪ Legislative developments: the Control of Major Accident Hazard Regulations 2015 ▪ Part 1: COMAH and the role of Public Health England ▪ Part 2: Public health information in COMAH off-site emergency plans ▪ Review of incidents occurring at COMAH sites in England and Wales, January 2009 – June 2011 ▪ Lessons learnt from a COMAH site exercise: A public health trainee's view ▪ A review of Health Protection Agency involvement in incidents occurring at sites regulated under the Control of Major Accident Hazards (COMAH) Regulations D10:D19

33m	To strengthen the capacity of local authorities to evacuate persons living in disaster-prone areas	• **PHE:** Institutional engagement - National Incident & Emergency Response Plan includes measures to ensure support work programme and evidence based decision making. Provision of expertise to: Scientific Advisory Group for Emergencies (SAGE) and National Security Council (Threats, Hazards, Resilience and Contingencies) (sometimes referred to as COBR). Resilience assistance via establishment of operational support cells by incident management team (IMT). Example publications dealing with issues in evacuation scenarios:
		  o Disaster-Driven Evacuation and Medication Loss: a Systematic Literature Review
		  o Medication supply for people evacuated during disasters.
		  o Guidance available on sheltering or evacuation during an acute incident
		• **ERD ST**: REACHING OUT- Demonstration of EU effective large scale threat and crisis management outside the EU

33n	To establish a mechanism of case registry and a database of mortality caused by disaster in order to improve the prevention of morbidity and mortality	• PHE: Field Epidemiology Training Programme (FETP) (Measuring morbidity + mortality). The 2 year programme is aimed at medical, nursing, scientific, or veterinary staff who are, or whose future career may be, in a post involving field investigation and epidemiology and who want to further enhance their specialist skills. The programme provides training and experience to develop the competencies agreed for field epidemiologists in the European Union (EU).
		  o Trainers = FETP Fellows.
		  o Programme is part of RST engagement through IHR work going forwards.
		  o Aims: Evaluate surveillance systems and help strengthen surveillance systems through recommendations, based on programme of teaching, training and outbreak investigation. Aim to aid those in other countries through teaching and training from those who graduate the programme. Has remit at local, national, regional and global levels.
		  o Benefits: Utility to collect human resources in organisation.
		  o Focus: Surveys in areas with disasters (including focus on mortality, morbidity, vax coverage, nutrition). Conduct applied research with view to quick implementation to guidance/changes in policy. Cover ALL hazards, competencies including in programme are comprehensive (found on website).
		  o Syndromic surveillance: systems and analyses: . These data collection and analysis systems provide an early warning system of the spread of illness across England. PHE's real-time

		syndromic surveillance team (ReSST) coordinates several national syndromic systems: we collect and analyse the health data from several sources, looking for trends indicating higher-than-usual levels of illness and publish bulletins to keep public health professionals up to date.
		• **EPRR:** Ongoing work to develop plans for major incident health register for major health emergencies
		• **CRCE:** A health register is a way to collate details of individuals affected by or exposed to a specific incident.
		  o The purpose of establishing a health register is:
		    ▪ to enable appropriate advice on relevant immediate interventions to be provided
		    ▪ to facilitate access to appropriate services
		    ▪ to enable timely assessment of the health impact of the incident
		    ▪ to identify longer-term health implications of the incident
		    ▪ to provide reassurance to the public and decision to trigger a register rests with incident director, implementation typically requires deployment of Field Epidemiology Services (FES) staff and/or FETP fellows .
		  o PHE has developed arrangements for triggering and deployment of a health register, see page 31 on: http://phenet.phe.gov.uk/Resources/emergencyresponse/Documents/PHE-national-incident-emergency-response-plan.pdf
		  o For example: Protocol for establishing a health register after a flood which provides a framework for countries to establish a health register after a flood event. The protocol is based on Public Health England's (PHE's) Major Incident Health Register Implementation Plan, written by members of the PHE Health Register Project Group.

33o	To enhance recovery schemes to provide psychosocial support and mental health services for all people in need	• **PHE Health Protection**: NICC (National Incident Coordination Centre) Ebola management included: Epidemiological updates including losses and impact information; UK Public Health Rapid Support Team (RST) o Announced in November 2016, consisting of clinicians, scientists and academics, can be deployed to tackle outbreaks of disease anywhere in the world within 48 hours. They will be on call to respond to urgent requests from countries around the world and fly in to help tackle disease outbreaks at source. Work comes down to responsibility - Rapid support and psychological support teams (work under remit of RST) • **ERD ST:** REACHING OUT- Demonstration of EU effective large scale threat and crisis management outside the EU. WHO EBOLA - Investigation into the well-being of humanitarian workers in during and following overseas and local deployments to aid in disaster relief based on support systems such as organisational and mental health support. Includes recommendations as to best practice in supporting psychosocial well-being of deployed personnel.

33p	To review and strengthen, as appropriate, national laws and procedures on international cooperation, based on the Guidelines for the Domestic Facilitation and Regulation of International Disaster Relief and Initial Recovery Assistance	**ERD ST:** REACHING OUT- Demonstration of EU effective large scale threat and crisis management outside the EU **Global Public Health**: Priority outlined in PHE Global Health Strategy (2014 to 2019) to "Improving global health security and meeting responsibilities under the International Health Regulations". Improving global health security and meeting responsibilities under the International Health Regulations – focusing on antimicrobial resistance, mass gatherings, extreme events, climate change, bioterrorism, emergency response, new and emerging infections, cross border threats, and migrant and travel health. IHR National Focal Point. Communication function sits within PHE (for UK). Role includes reporting: - UK Public Health Rapid Support Team (RST) – Work is under remit of implementing Global Health Security Agenda - Announced in November 2016, consisting of clinicians, scientists and academics, can be deployed to tackle outbreaks of disease anywhere in the world within 48 hours. They will be on call to respond to urgent requests from countries around the world and fly in to help tackle disease outbreaks at source.

Annex 2: regional and global

Para no.	Sendai Framework for Disaster Risk Reduction - Text	PHE example projects
Priority 1: Understanding Disaster Risk		

25a	To enhance the development and dissemination of science-based methodologies and tools to record and share disaster losses and relevant disaggregated data and statistics, as well as to strengthen disaster risk modelling, assessment, mapping, monitoring and multi-hazard early warning systems;	• **NIS**: Epidemiologists and microbiologists into the RST and actively contributing to the development of the research strategy for the RST. Working closely with the PHE Global health Directorate to ensure an effective contribution to PHE's Global Health priorities. Contributing to ODA-funded project to strengthen capability in a number of countries in the context of the International health Regulations. NIS is active in a number of areas of work internationally and log of NIS's international commitments has been developed:
		   o Research and Development including academic collaborations and grant-funded work.
		   o Provision of expert technical advice through consultancy arrangements or international reference laboratories including WHO accredited reference laboratories including development of field diagnostics.
		   o Training including needs assessment, delivery of technical training in country, training staff visiting the UK and developing of training materials.
		   o Provision of field epidemiology and microbiology capacity and response to outbreaks and incidents following requests from GOARN, ECDC or directly from affected countries to PHE.
		• **PHE Health Protection**: UK Public Health Rapid Support Team (RST) Announced in November 2016, consisting of clinicians, scientists and academics, can be deployed to tackle outbreaks of disease anywhere in the world within 48 hours. They will be on call to respond to urgent requests from countries around the world and fly in to help tackle disease outbreaks at source. Activities include undertaking a rapid risk assessment when on mission in country. Working across the WHO led global public health rapid response team network to standardise operational arrangements, training and pre-deployment approval mechanisms. Collaborates with the Institute for Health Metrics and Evaluation on the Global Burden of Disease programme. It includes the modelling of the disease burden due to "Forces of nature, war and legal interventions". Global Burden of Disease visualization application.
		• **PHE in Sierra Leone**: Support of implementation of WHO Strategic Tool for Prioritizing Risks (STAR) in Sierra Leone in October-November 2016. This led to identification of 46 specific strategic level risks within the country. Plans are in place to develop a program of consolidation, assign risk leads and set out preparedness mechanisms. Support for development of incident specific plans in context of Sierra Leone for potential outbreaks (eg Cholera, Polio, Ebola, Zika).
		• **Global Public Health:** PHE is an active member of GOARN and regularly provides technical experts for deployments, is a member of the steering committee, supports development of training resources and

participates in weekly awareness and risk assessment calls. Provision of technical expertise, including field epidemiology, microbiology, IPC and C3 to outbreaks and incidents following requests from GOARN, ECDC or directly from affected countries to PHE.

- **GDRR:** Involved in a series of research programmes including:
    - Forecasts for AnTicipatory HUManitarian action (FATHUM) (RCUK)
    - Science for Humanitarian Emergencies & Resilience (SHEAR) (NERC funded)
    - EnhANcing emergencY management and response to extreme WeatHER and climate Events (ANYWHERE) (Horizon 2020)
    - High Impact Weather Programme (HIWeather) (WMO)
    - Research methodology used on global level:
        - Use of GIS in Japan - The Great East Japan Earthquake Disaster: Distribution of Hospital Damage in Miyagi Prefecture

- **CRCE:**
    - REACHING OUT project - Horizon 2020 funded project, working with EU MS partners who are developing tools for use Internationally (ie Africa, Israel, Asia) However, the strategy for how these tools are embedded across UK (ie Disaster Recovery Tool (DRT)/ Psychological first aid tool/ Audio Visual Assessment Tool (AVA) is yet to be determined on how they will contribute to us (UK) in meeting strategic commitments to the Sendai Framework. The Disaster Recovery Tool (DRT) will provide evidence based guidance (decision makers and community level action) for the recovery and remediation of the environment following both natural or manmade disasters and crises. How information is accessed is also being investigated; it is likely that information will be provided by SMS, IVR, web application (HTML) and as a printed hard copy (back-up).
    - EMETNET (European Multiple Environmental Emergencies Network) is an EU project part funded by DG ECHO (Directorate-General for European Civil Protection and Humanitarian Aid). However, the strategy for how the Rapid Risk Assessment (RRA), Impact Assessment Scale and Network of Experts will be embedded across UK is yet to be determined on how they will contribute to us (UK) in meeting strategic commitments to the Sendai Framework. Rapid risk assessment methodology for emerging environmental threats; Impact assessment of emerging environmental threats (health, environmental, economic and cross-sectoral impacts) to inform risk management, planning and response.
        - Note: Strategy for how the Rapid Risk Assessment (RRA); Impact Assessment Scale and Network of Experts will be embedded across UK is yet to be determined to enable UK to meet our strategic commitments to Sendai Framework.
        - Impact Assessment Scale for natural or manmade disasters.

25b	To promote the conduct of comprehensive surveys on multi-hazard disaster risks and the development of regional disaster risk assessments and maps, including climate change scenarios;	• **PHE**: Civil Contingencies Secretariat National Capability Survey: Annual assessment of domestic EPRR capability against set of core international standards. Support of implementation of WHO Strategic Tool for Prioritizing Risks (STAR) in Sierra Leone in October-November 2016. Led to identification of 46 specific strategic level risks within the country. Plans are in place to develop a program of consolidation, assign risk leads and set out preparedness mechanisms.

		• **Global Public Health**: Priority outlined in PHE Global Health Strategy (2014 to 2019) to "Improving global health security and meeting responsibilities under the International Health Regulations". Programme of support for strengthening IHR capacity in LMICs and within the AFRO region. Provision of support to WHO, including WHE and the monitoring and evaluation programme to enhance IHR compliance; including provision of technical experts to Joint External Evaluations in a range of countries

25c	To promote and enhance, through international cooperation, including technology transfer, access to and the sharing and use of non-sensitive data and information, as appropriate, communications and geospatial and space-based technologies and related services; maintain and strengthen in situ and remotely-sensed earth and climate observations; and strengthen the utilization of media, including social media, traditional media, big data and mobile phone networks, to support national measures for successful disaster risk communication, as appropriate and in accordance with national laws;	• **CKO**: Collaborates with the Institute for Health Metrics and Evaluation on the Global Burden of Disease programme. It includes the modelling of the disease burden due to "Forces of nature, war and legal interventions". Global Burden of Disease visualization application
		 • **CRCE:** REACHING OUT project - Horizon 2020 funded project, working with EU MS partners who are developing tools for use Internationally (ie Africa, Israel, Asia) However, the strategy for how these tools are embedded across UK (ie Disaster Recovery Tool (DRT)/ Psychological first aid tool/ Audio Visual Assessment Tool (AVA) is yet to be determined on how they will contribute to us (UK) in meeting strategic commitments to the Sendai Framework. The Disaster Recovery Tool (DRT) will provide evidence based guidance (decision makers and community level action) for the recovery and remediation of the environment following both natural or manmade disasters and crises. How information is accessed is also being investigated; it is likely that information will be provided by SMS, IVR, web application (HTML) and as a printed hard copy (back-up).
		 • **GDRR**: Engagement with and support provided for a number of organisations aiming to ensure quality standards, especially with respect to information. These include:
		     ○ UK Alliance for Disaster Research (UKADR)
		     ○ Scientific and Technical Advisory Group (STAG) for United Nations Office for Disaster Risk Reduction (UNISDR)
		         ▪ GDRR Consultant performing role of Vice-Chair (2008 – 2017).
		         ▪ "The purpose of the STAG is to provide technical advice and support in the formulation and implementation of activities carried out by the disaster risk reduction community. The work of the STAG encompasses all aspects of the scientific and technical dimensions of risk reduction, with particular emphasis on the needs of developing countries."
		     ○ Integrated Research on Disaster Risk (IRDR)
		         ▪ GDRR Consultant member of scientific committee
		         ▪ "Integrated Research on Disaster Risk (IRDR) is a decade-long, interdisciplinary research programme sponsored by ICSU in partnership with the International Social Science Council (ISSC), and the United Nations International Strategy for Disaster Reduction (UN-ISDR). It is a global initiative seeking to address the challenges brought by natural hazard events, mitigate their impacts, and improve related policy-making mechanisms."
		     ○ CODATA
		         ▪ Please see entry on 27J
		     ○ Digital Belt and Road (DBAR) Initiative
		         ▪ Assistance through capacities in digital, data and DRR aspects of programme.

25d	To promote common efforts in partnership with the scientific and technological community, academia and the private sector to establish, disseminate and share good practices internationally;	**PHE Health Protection**: UK Public Health Rapid Support Team (RST) was announced in November 2016, consisting of clinicians, scientists and academics, can be deployed to tackle outbreaks of disease anywhere in the world within 48 hours. They will be on call to respond to urgent requests from countries around the world and fly in to help tackle disease outbreaks at source. - Activities include undertaking a rapid risk assessment when on mission in country. - Working across the WHO led global public health rapid response team network to standardise operational arrangements, training and pre-deployment approval mechanisms. **GDRR**: Engagement with and support provided for a number of organisations aiming to ensure quality standards, especially with respect to information. These include: - UK Alliance for Disaster Research (UKADR) - Scientific and Technical Advisory Group (STAG) for United Nations Office for Disaster Risk Reduction (UNISDR) - GDRR Consultant performing role of Vice-Chair (2008 – 2017). "The purpose of the STAG is to provide technical advice and support in the formulation and implementation of activities carried out by the disaster risk reduction community. The work of the STAG encompasses all aspects of the scientific and technical dimensions of risk reduction, with particular emphasis on the needs of developing countries." - Integrated Research on Disaster Risk (IRDR) - GDRR Consultant member of scientific committee "Integrated Research on Disaster Risk (IRDR) is a decade-long, interdisciplinary research programme sponsored by ICSU in partnership with the International Social Science Council (ISSC), and the United Nations International Strategy for Disaster Reduction (UN-ISDR). It is a global initiative seeking to address the challenges brought by natural hazard events, mitigate their impacts, and improve related policy-making mechanisms." - CODATA - Please see entry on 27J - Digital Belt and Road (DBAR) Initiative - Assistance through capacities in digital, data and DRR aspects of programme. - CRCE was part of the DG ECHO Cross-border Exposure characterisation for Risk Assessment in Chemical Incidents (CERACI) project. Related publication: Assessing and improving cross-border chemical incident preparedness and response across Europe

25e	To support the development of local, national, regional and global user-friendly systems and services for the exchange of information on good practices, cost-effective and easy-to-use disaster risk reduction technologies and lessons learned on policies, plans and measures for disaster risk reduction;	**PHE:** Collaborates with the Institute for Health Metrics and Evaluation on the Global Burden of Disease programme. It includes the modelling of the disease burden due to "Forces of nature, war and legal interventions". Global Burden of Disease visualization application. **ERD:** Training same as local and national remit, has been successful in bidding for contracts to design and deliver exercise and training programmes for the World Health Organization (WHO), Food and Agricultural Organisation (UNFAO), the European Commission (EC), the European Centre for Disease Prevention and Control (ECDC) and USAID. **GDRR**: Engagement with and support provided for a number of organisations aiming to ensure quality standards, especially with respect to information. These include: - UK Alliance for Disaster Research (UKADR) - Scientific and Technical Advisory Group (STAG) for United Nations Office for Disaster Risk Reduction (UNISDR) - GDRR Consultant performing role of Vice-Chair (2008 - 2017). "The purpose of the STAG is to provide technical advice and support in the formulation and implementation of activities carried out by the disaster risk reduction community. The work of the STAG encompasses all aspects of the scientific and technical dimensions of risk reduction, with particular emphasis on the needs of developing countries." - Integrated Research on Disaster Risk (IRDR) - GDRR Consultant member of scientific committee "Integrated Research on Disaster Risk (IRDR) is a decade-long, interdisciplinary research programme sponsored by ICSU in partnership with the International Social Science Council (ISSC), and the United Nations International Strategy for Disaster Reduction (UN-ISDR). It is a global initiative seeking to address the challenges brought by natural hazard events, mitigate their impacts, and improve related policy-making mechanisms." - CODATA - Please see entry on 27J - Digital Belt and Road (DBAR) Initiative - Assistance through capacities in digital, data and DRR aspects of programme.

25f	To develop effective global and regional campaigns as instruments for public awareness and education, building on the existing ones (for example, the "One million safe schools and hospitals" initiative; the "Making Cities Resilient: My city is getting ready" campaign; the United Nations Sasakawa Award for Disaster Risk Reduction; and the annual United Nations International Day for Disaster Reduction), to promote a culture of disaster prevention, resilience and responsible citizenship, generate understanding of disaster risk, support mutual learning and share experiences; and encourage public and private stakeholders to actively engage in such initiatives and to develop new ones at the local, national, regional and global levels;	• **GDRR**: Development role in WHO's safer hospitals campaign. Noting impact of publication of "Review of five London hospital fi res and their management JANUARY 2008 – FEBRUARY 2009" (2009)
25g	To enhance the scientific and technical work on disaster risk reduction and its mobilization through the coordination of existing networks and scientific research institutions at all levels and in all regions, with the support of the United Nations Office for Disaster Risk Reduction Scientific and Technical Advisory Group, in order to strengthen the evidence base in support of the implementation of the present Framework; promote scientific research on disaster risk patterns, causes and effects; disseminate risk information with the best use of geospatial information technology; provide guidance on methodologies and standards for risk assessments, disaster risk modelling and the use of data; identify research and technology gaps and set recommendations for research priority areas in disaster risk reduction; promote and support the availability and application of science and technology to decision-making; contribute to the update of the publication entitled "2009 UNISDR	• **PHE in Sierra Leone**: Support of implementation of WHO Strategic Tool for Prioritizing Risks (STAR) in Sierra Leone in October-November 2016. 　　o Led to identification of 46 specific strategic level risks within the country. 　　o Plans are in place to develop a program of consolidation, assign risk leads and set out preparedness mechanisms. • Support for development of incident specific plans in context of Sierra Leone for potential outbreaks (eg Cholera, Polio, Ebola, Zika). • **GDRR:** Supported UNISDR processing outputs of UN Open-Ended Intergovernmental Working Group on indicators and terminology relating to disaster risk reduction. Work included co-organisation of Loss Data Workshop hosted in Royal Society, London in February 2017. Attendees included international experts in DRR and country representatives. Engagement with and support provided for a number of organisations aiming to ensure quality standards, especially with respect to information. These include: 　　o UK Alliance for Disaster Research (UKADR) 　　o Scientific and Technical Advisory Group (STAG) for United Nations Office for Disaster Risk Reduction (UNISDR) 　　　▪ GDRR Consultant performing role of Vice-Chair (2008 – 2017). 　　　▪ "The purpose of the STAG is to provide technical advice and support in the formulation and implementation of activities carried out by the disaster risk reduction community. The work of the STAG encompasses all aspects of the scientific and technical dimensions of risk reduction, with particular emphasis on the needs of developing countries." 　　o Integrated Research on Disaster Risk (IRDR) 　　　▪ GDRR Consultant member of scientific committee

	Terminology on Disaster Risk Reduction"; use post-disaster reviews as opportunities to enhance learning and public policy; and disseminate studies;	▪ "Integrated Research on Disaster Risk (IRDR) is a decade-long, interdisciplinary research programme sponsored by ICSU in partnership with the International Social Science Council (ISSC), and the United Nations International Strategy for Disaster Reduction (UN-ISDR). It is a global initiative seeking to address the challenges brought by natural hazard events, mitigate their impacts, and improve related policy-making mechanisms."
		o CODATA
		  ▪ Please see entry on 27J
		o Digital Belt and Road (DBAR) Initiative
		  ▪ Assistance through capacities in digital, data and DRR aspects of programme.

25h	To encourage the availability of copyrighted and patented materials, including through negotiated concessions, as appropriate;	• **GDRR:** Supporting efforts by Evidence Aid to improve open-knowledge of relevant research based techniques in the context of disasters and humanitarian emergencies.

25i	To enhance access to and support for innovation and technology, as well as in long-term, multi-hazard and solution-driven research and development in the field of disaster risk management.	• **ERD ST:** Geographic Information Systems (GIS) program
		o Resources include: Corporate geospatial database, Esri ArcGIS software, training, web-services, Portal for ArcGIS (Portal) (in-production)
		  ▪ Explanation of Portal for ArcGIS
		o Research methodology used on global level:
		  ▪ Use of GIS in Japan - The Great East Japan Earthquake Disaster: Distribution of Hospital Damage in Miyagi Prefecture
		o Bio-terrorism and Emerging Disease Analysis (Modelling)
		  ▪ The modelling team develop and apply established and bespoke mathematical models to assess and predict the potential public health impacts of newly emerging and potential infectious disease threats and the likely relative benefits of different mitigation strategies.
		o Medical Entomology and Zoonoses Ecology (MEZE)
		  ▪ MEZE undertake worldwide Horizon Scanning to: develop an understanding of global emerging infectious disease (EID) issues to assess their threat to the UK identify current knowledge and information gaps to help direct and inform qualitative and quantitative approaches to relevant risk assessments carry out qualitative and quantitative risk assessments on new, emerging and re-emerging infectious diseases that pose threats to the UK ahead-of-time, through collaboration and consultation with both academic and cross- governmental groups.
		o Scientific Computing Team
		  ▪ The team provides specialist IT services to the other teams in MRA for: modelling, GIS, MEZE, behavioural science. They collaborate with others around the agency, and outside, to develop innovative IT solutions for a wide range of scientific and health protection related projects.
		o Behavioural Science

		- The behavioural science team (BST) conducts work in the areas of psychological and behavioural responses to conventional terrorism, natural disasters and chemical, biological, radiological and nuclear (CBRN) incidents. - Global disease outbreak monitoring and mapping - Microbial risk assessment produces a monthly summary report of global infectious disease outbreaks, incidents and events.
Priority 2: Strengthening Disaster Risk Governance to manage disaster risk		
28a	To guide action at the regional level through agreed regional and sub-regional strategies and mechanisms for cooperation for disaster risk reduction, as appropriate, in the light of the present Framework, in order to foster more efficient planning, create common information systems and exchange good practices and programmes for cooperation and capacity development, in particular to address common and transboundary disaster risks;	**PHE Health Protection**: UK Public Health Rapid Support Team (RST) – Work is under remit of implementing Global Health Security Agenda. Announced in November 2016, consisting of clinicians, scientists and academics, can be deployed to tackle outbreaks of disease anywhere in the world within 48 hours. They will be on call to respond to urgent requests from countries around the world and fly in to help tackle disease outbreaks at source. Activities include undertaking a rapid risk assessment when on mission in country. Working across the WHO led global public health rapid response team network to standardise operational arrangements, training and pre-deployment approval mechanisms. **Global Public Health**: Priority outlined in PHE Global Health Strategy (2014 to 2019) to "Improving global health security and meeting responsibilities under the International Health Regulations". Programme of support for strengthening IHR capacity in LMICs and within the AFRO region. Provision of support to WHO, including WHE and the monitoring and evaluation programme to enhance IHR compliance; including provision of technical experts to Joint External Evaluations in a range of countries **PHE in Sierra Leone**: Proactive in supporting development of: - All hazard incident emergency response plan for Sierra Leone Ministry of Health and Sanitation. - Incident specific plans in context of Sierra Leone for potential outbreaks (eg Cholera, Polio, Ebola, Zika). - Strategic concept of operation document in Sierra Leone - Strategic documentation for preparedness of public health ordinance in Sierra Leone (currently under review by Sierra Leone government). - Convened and key role in implementation of Public Health Emergency Management Committee (PHEMC) in Sierra Leone, which meets quarterly. - Public Health National Emergency Operations Centre (PHNEOC) is under the remit of this group. - Convened Strategic Governance Group chaired by Sierra Leone's Chief Medical Officer. - Routine outputs of the Group include strategy, policy and review documents. - Formation of Public Health National Emergency Operations Centre (PHNEOC) as part of follow up response to Ebola - Group coordinates response measures in public health events and acts as a central

		repository. ▪ Office of capacity c.50 is located in Freetown, Sierra Leone, with PHE carrying out FETP program trainings there. ▪ Roughly 500 Ministry of Health staff have been trained in emergency management and EOC functionality thus far. ▪ Routine outputs of centre include: quarterly newsletters and information dissemination.

28b	To foster collaboration across global and regional mechanisms and institutions for the implementation and coherence of instruments and tools relevant to disaster risk reduction, such as for climate change, biodiversity, sustainable development, poverty eradication, environment, agriculture, health, food and nutrition and others, as appropriate;	• **PHE in Sierra Leone:** Establishment of FETP training packages across academic and governmental institutions several countries in West Africa. Aim to work with WHO AFRO to roll out in the AFRO region more widely.
		• **Global Public Health**: Priority outlined in PHE Global Health Strategy (2014 to 2019) to "Improving global health security and meeting responsibilities under the International Health Regulations". Programme of support for strengthening IHR capacity in LMICs and within the AFRO region. Provision of support to WHO, including WHE and the monitoring and evaluation programme to enhance IHR compliance; including provision of technical experts to Joint External Evaluations in a range of countries. Digital Belt and Road (DBAR) Initiative. Assistance through capacities in digital, data and DRR aspects of programme.
		• **CRCE**: REACHING OUT project - Horizon 2020 funded project, working with EU MS partners who are developing tools for use Internationally (ie Africa, Israel, Asia) However, the strategy for how these tools are embedded across UK (ie Disaster Recovery Tool (DRT)/ Psychological first aid tool/ Audio Visual Assessment Tool (AVA) is yet to be determined on how they will contribute to us (UK) in meeting strategic commitments to the Sendai Framework. The Disaster Recovery Tool (DRT) will provide evidence based guidance (decision makers and community level action) for the recovery and remediation of the environment following both natural or manmade disasters and crises. How information is accessed is also being investigated; it is likely that information will be provided by SMS, IVR, web application (HTML) and as a printed hard copy (back-up). EMETNET (European Multiple Environmental Emergencies Network) is an EU project part funded by DG ECHO (Directorate-General for European Civil Protection and Humanitarian Aid). However, the strategy for how the Rapid Risk Assessment (RRA), Impact Assessment Scale and Network of Experts will be embedded across UK is yet to be determined on how they will contribute to us (UK) in meeting strategic commitments to the Sendai Framework. Rapid risk assessment methodology for emerging environmental threats; Impact assessment of emerging environmental threats (health, environmental, economic and cross-sectoral impacts) to inform risk management, planning and response.
		   o Note: Strategy for how the Rapid Risk Assessment (RRA); Impact Assessment Scale and Network of Experts will be embedded across UK is yet to be determined to enable UK to meet our strategic commitments to Sendai Framework.
		   o Impact Assessment Scale for natural or manmade disasters.

28c	To actively engage in the Global Platform for Disaster Risk Reduction, the regional and sub-regional platforms for disaster risk reduction and the thematic platforms in order to forge partnerships, periodically assess progress on implementation and share practice and knowledge on disaster risk-informed policies, programmes and investments, including on development and climate issues, as appropriate, as well as to promote the integration of disaster risk management in other relevant sectors. Regional intergovernmental organizations should play an important role in the regional platforms for disaster risk reduction;	• **GDRR**: Engaged with international expert events across a number of roles including: representation, organisation, deliberation activities and output process. Events included
		   o European Forum for Disaster Risk Reduction (Turkey, March 2017)
		      ▪ Pre-conference event: Gender-Responsive Strategies for Disaster Risk Reduction
		      ▪ Pre-conference event: Science and Technology to support Disaster Risk Reduction in Europe
		   o Global Platform for Disaster Risk Reduction (Mexico, May 2017)
		   o Loss Data Workshop focused on technical guidance provisions on indicators approved by UN General Assembly for country reporting on Sendai Global Targets.

28d	To promote trans-boundary cooperation to enable policy and planning for the implementation of ecosystem-based approaches with regard to shared resources, such as within river basins and along coastlines, to build resilience and reduce disaster risk, including epidemic and displacement risk;	• **NIS**: Exists to protect and improve nation's health from infectious disease and reduce health inequalities arising from the burden of infectious disease. Methods of assistance include: surveillance, support provided to NHS, provision of bulletins, supporting resilience and response.
		• **ERD ST**: Medical entomology and zoonoses ecology (MEZE)(Part of ERD)
		   o MEZE undertake worldwide Horizon Scanning to develop an understanding of global emerging infectious disease (EID) issues to enable an assessment of their likely threat to the UK, and to identify current knowledge and information gaps to help direct and inform qualitative and quantitative approaches to microbial risk assessments. This also involves carrying out qualitative and quantitative risk assessments on new, emerging and re-emerging infectious diseases threats to the UK ahead-of-time, through collaboration and consultation with both academic and cross- governmental groups.
		   o Sample publications:
		      ▪ Enhanced West Nile virus surveillance in the North Kent marshes, UK,
		      ▪ Colonization of a newly constructed urban wetland by mosquitoes in England: implications for nuisance and vector species.
		   o Membership of the Human Animal Infections Risk Surveillance (HAIRS) group which inputs into DH's National Expert Panel on New and Emerging Infections (NEPNEI).
		      ▪ Includes risk assessments on emerging tick-borne bacteria in the UK, squirrel Bornavirus, Zika virus, hantavirus, Chikungunya virus, Mycobacterium bovis in cats, HAIRS risk assessment: marine mammal Brucella species, Implementation of One Health program concerned with infectious diseases movement from animals to humans.
		      ▪ HAIRS Report 2013-2015

| 28e | To promote mutual learning and exchange of good practices and information through, inter alia, voluntary and self-initiated peer reviews among interested States; | **Global Public Health**: Priority outlined in PHE Global Health Strategy (2014 to 2019) to "Improving global health security and meeting responsibilities under the International Health Regulations". Programme of support for strengthening IHR capacity in LMICs and within the AFRO region. Provision of support to WHO, including WHE and the monitoring and evaluation programme to enhance IHR compliance; including provision of technical experts to Joint External Evaluations in a range of countries. WHO Collaborating Centre on Mass Gatherings and Global Health Security: Provision of risk assessment framework and strengthening IHR compliance through planning and delivering mass gatherings, Delivery of training and exercises for delivering public health best practice at mass gatherings. **PHE in Sierra Leone:** Proactive in supporting development of: All hazard incident emergency response plan for Sierra Leone Ministry of Health and Sanitation. Incident specific plans in context of Sierra Leone for potential outbreaks (eg Cholera, Polio, Ebola, Zika). Strategic concept of operation document in Sierra Leone Strategic documentation for preparedness of public health ordinance in Sierra Leone (currently under review by Sierra Leone government). **CRCE**: CBRN Recovery Handbooks: PHE has developed guidance handbooks which can be used in the remediation and recovery phase following a biological, chemical or radiation incident. To complement the handbooks, interactive support tools (for chemical and radiation incidents) have been developed to help with the decision-making process for developing a recovery strategy. Guidance and templates for recording and reporting decisions on recovery are also available. These resources are for evaluating recovery options (remediation techniques) that are likely to be the most appropriate, applicable and effective on a site- and incident-specific basis: chemical recovery navigation tool chemical recovery record form radiation recovery navigation tool (Inhabited areas; Food; Drinking water) radiation recovery record form e-learning module: principles of recovery and remediation guidance on recovery after a chemical, biological or radiation (CBRN) incident, including HazMat CRCE was part of the DG ECHO Cross-border Exposure characterisation for Risk Assessment in Chemical Incidents (CERACI) project. Related publication: Assessing and improving cross-border chemical incident preparedness and response across Europe |

| 28f | To promote the strengthening of, as appropriate, international voluntary mechanisms for monitoring and assessment of disaster risks, including relevant data and information, benefiting from the experience of the Hyogo Framework for Action Monitor. Such mechanisms may promote the exchange of non-sensitive information on disaster risks to the relevant national Government bodies and stakeholders in the interest of sustainable social and economic development. | **Global Public Health:** IHR National Focal Point - Communication function sits within PHE (for UK). Role includes reporting. **PHE in Sierra Leone**: Proactive in supporting development of: All hazard incident emergency response plan for Sierra Leone Ministry of Health and Sanitation. Incident specific plans in context of Sierra Leone for potential outbreaks (eg Cholera, Polio, Ebola, Zika). Strategic concept of operation document in Sierra Leone Strategic documentation for preparedness of public health ordinance in Sierra Leone (currently under review by Sierra Leone government). Convened and key role in implementation of Public Health Emergency Management Committee (PHEMC) in Sierra Leone, which meets quarterly. Public Health National Emergency Operations Centre (PHNEOC) is under the remit of this group. Convened Strategic Governance Group chaired by Sierra Leone's Chief Medical Officer. Routine outputs of the Group include strategy, policy and review documents. Formation of Public Health National Emergency Operations Centre (PHNEOC) as part of follow up response to Ebola Group coordinates response measures in public health events and acts as a central repository. Office of capacity c.50 is located in Freetown, Sierra Leone, with PHE carrying out FETP program trainings there. Roughly 500 Ministry of Health staff have been trained in emergency management and EOC functionality thus far. Routine outputs of centre include: quarterly newsletters and information dissemination. **GDRR**: Global Hazards Weekly Bulletin is sent as part of WHO Collaborating Centre on Mass Gatherings and Global Health Security to total subscriber base of 6,000. Engaged with international expert events across a number of roles including: representation, organisation, deliberation activities and output process. Events including European Forum for Disaster Risk Reduction (Turkey, March 2017) Pre-conference event: Gender-Responsive Strategies for Disaster Risk Reduction Pre-conference event: Science and Technology to support Disaster Risk Reduction in Europe Global Platform for Disaster Risk Reduction (Mexico, May 2017) Loss Data Workshop focused on technical guidance provisions on indicators approved by UN General Assembly for country reporting on Sendai Global Targets. **CRCE**: REACHING OUT project - Horizon 2020 funded project, working with EU MS partners who are developing tools for use Internationally (ie Africa, Israel, Asia) However, the strategy for how these tools are embedded across UK (ie Disaster Recovery Tool (DRT)/ Psychological first aid tool/ Audio Visual Assessment Tool (AVA) is yet to be determined on how they will contribute to us (UK) in meeting strategic commitments to the Sendai Framework. The Disaster Recovery Tool (DRT) will provide evidence based guidance (decision makers and community level action) for the recovery and |

<table>
<tr>
<td colspan="2"></td>
<td>

- remediation of the environment following both natural or manmade disasters and crises. How information is accessed is also being investigated; it is likely that information will be provided by SMS, IVR, web application (HTML) and as a printed hard copy (back-up).
- EMETNET (European Multiple Environmental Emergencies Network) is an EU project part funded by DG ECHO (Directorate-General for European Civil Protection and Humanitarian Aid). However, the strategy for how the Rapid Risk Assessment (RRA), Impact Assessment Scale and Network of Experts will be embedded across UK is yet to be determined on how they will contribute to us (UK) in meeting strategic commitments to the Sendai Framework. Rapid risk assessment methodology for emerging environmental threats; Impact assessment of emerging environmental threats (health, environmental, economic and cross-sectoral impacts) to inform risk management, planning and response.
  - Note: Strategy for how the Rapid Risk Assessment (RRA); Impact Assessment Scale and Network of Experts will be embedded across UK is yet to be determined to enable UK to meet our strategic commitments to Sendai Framework.
  - Impact Assessment Scale for disasters

</td>
</tr>
<tr>
<td colspan="3">Priority 3: Investing in disaster risk reduction for resilience</td>
</tr>
<tr>
<td>31a</td>
<td>To promote coherence across systems, sectors and organizations related to sustainable development and to disaster risk reduction in their policies, plans, programmes and processes;</td>
<td>

- **Global Public Health**: Priority outlined in PHE Global Health Strategy (2014 to 2019) to "Improving global health security and meeting responsibilities under the International Health Regulations". Designing programme of support for building capacity related to IHR in LMICs. Broader public health system strengthening activities in Sierra Leone and Pakistan in partnership with DfID.
- **PHE in Sierra Leone**: Convened and key role in implementation of Public Health Emergency Management Committee (PHEMC) in Sierra Leone, which meets quarterly. Public Health National Emergency Operations Centre (PHNEOC) is under the remit of this group. Convened Strategic Governance Group chaired by Sierra Leone's Chief Medical Officer. Routine outputs of the Group include strategy, policy and review documents. Formation of Public Health National Emergency Operations Centre (PHNEOC) as part of follow up response to Ebola
  - Group coordinates response measures in public health events and acts as a central repository.

</td>
</tr>
</table>

		o Office of capacity c.50 is located in Freetown, Sierra Leone, with PHE carrying out FETP program trainings there. o Roughly 500 Ministry of Health staff have been trained in emergency management and EOC functionality thus far. o Routine outputs of centre include: quarterly newsletters and information dissemination.
31b	To promote the development and strengthening of disaster risk transfer and sharing mechanisms and instruments in close cooperation with partners in the international community, business, international financial institutions and other relevant stakeholders;	• **GDRR**: Engagement with and support provided for a number of organisations aiming to ensure quality standards, especially with respect to information. These include: o Scientific and Technical Advisory Group (STAG) for United Nations Office for Disaster Risk Reduction (UNISDR) ▪ GDRR Consultant performing role of Vice-Chair (2008 – 2017). ▪ "The purpose of the STAG is to provide technical advice and support in the formulation and implementation of activities carried out by the disaster risk reduction community. The work of the STAG encompasses all aspects of the scientific and technical dimensions of risk reduction, with particular emphasis on the needs of developing countries."
31c	To promote cooperation between academic, scientific and research entities and networks and the private sector to develop new products and services to help to reduce disaster risk, in particular those that would assist developing countries and their specific challenges;	• **GDRR**: Engagement with and support provided for a number of organisations aiming to ensure quality standards, especially with respect to information. These include: o Scientific and Technical Advisory Group (STAG) for United Nations Office for Disaster Risk Reduction (UNISDR) ▪ GDRR Consultant performing role of Vice-Chair (2008 - 2017). ▪ "The purpose of the STAG is to provide technical advice and support in the formulation and implementation of activities carried out by the disaster risk reduction community. The work of the STAG encompasses all aspects of the scientific and technical dimensions of risk reduction, with particular emphasis on the needs of developing countries." • **PHE in Sierra Leone**: Proactive in improving capacity through: o Agreement between Emory University, USA and Njala University, Sierra Leone to investigate training and support programs for graduates. Gave PHE opportunity to develop and put in place a support program for ongoing development of capacity of early stage professionals in country (eg through engagement in lab settings)
31d	To encourage the coordination between global and regional financial institutions with a view to assessing and anticipating the potential economic and social impacts of disasters;	

31e	To enhance cooperation between health authorities and other relevant stakeholders to strengthen country capacity for disaster risk management for health, the implementation of the International Health Regulations (2005) and the building of resilient health systems;	• **Global Public Health**: Priority outlined in PHE Global Health Strategy (2014 to 2019) to "Improving global health security and meeting responsibilities under the International Health Regulations". Programme of support for strengthening IHR capacity in LMICs and within the AFRO region. Provision of support to WHO, including WHE and the monitoring and evaluation programme to enhance IHR compliance; including provision of technical experts to Joint External Evaluations in a range of countries
		• Digital Belt and Road (DBAR) Initiative - Assistance through capacities in digital, data and DRR aspects of programme.
		• **PHE in Sierra Leone:** Convened and key role in implementation of Public Health Emergency Management Committee (PHEMC) in Sierra Leone, which meets quarterly. Public Health National Emergency Operations Centre (PHNEOC) is under the remit of this group. Convened Strategic Governance Group chaired by Sierra Leone's Chief Medical Officer. Routine outputs of the Group include strategy, policy and review documents. Formation of Public Health National Emergency Operations Centre (PHNEOC) as part of follow up response to Ebola:
		   o Group coordinates response measures in public health events and acts as a central repository.
		   o Office of capacity c.50 is located in Freetown, Sierra Leone, with PHE carrying out FETP program trainings there.
		   o Roughly 500 Ministry of Health staff have been trained in emergency management and EOC functionality thus far.
		   o Routine outputs of centre include: quarterly newsletters and information dissemination.
		• Enabled collaborative activity between national emergency preparedness actors in Sierra Leone and region. Organised visits to examine EOC structure and methods, and to develop a common framework for capacity building in the region.

31f	To strengthen and promote collaboration and capacity-building for the protection of productive assets, including livestock, working animals, tools and seeds;	
31g	To promote and support the development of social safety nets as disaster risk reduction measures linked to and integrated with livelihood enhancement programmes in order to ensure resilience to shocks at the household and community levels;	
31h	To strengthen and broaden international efforts aimed at eradicating hunger and poverty through disaster risk reduction;	

31i	To promote and support collaboration among relevant public and private stakeholders to enhance the resilience of business to disasters.	

Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction

| 34a | To develop and strengthen, as appropriate, coordinated regional approaches and operational mechanisms to prepare for and ensure rapid and effective disaster response in situations that exceed national coping capacities; | **Global Public Health**: Priority outlined in PHE Global Health Strategy (2014 to 2019) to "Improving global health security and meeting responsibilities under the International Health Regulations". Programme of support for strengthening IHR capacity in LMICs and within the AFRO region. Provision of support to WHO, including WHE and the monitoring and evaluation programme to enhance IHR compliance; including provision of technical experts to Joint External Evaluations in a range of countries Digital Belt and Road (DBAR) Initiative. Assistance through capacities in digital, data and DRR aspects of programme. Deployment of mobile labs in response to Ebola outbreak in Sierra Leone Field Epidemiology Training Programme (FETP): The 2 year programme is aimed at medical, nursing, scientific, or veterinary staff who are, or whose future career may be, in a post involving field investigation and epidemiology and who want to further enhance their specialist skills. The programme provides training and experience to develop the competencies agreed for field epidemiologists in the European Union (EU). Trainers = FETP Fellows. Programme is part of RST engagement through IHR work going forwards. Aims: Evaluate surveillance systems and help strengthen surveillance systems through recommendations, based on programme of teaching, training and outbreak investigation. Aim to aid those in other countries through teaching and training from those who graduate the programme. Has remit at local, national, regional and global levels. Benefits: Utility to collect human resources in organisation. Focus: Surveys in areas with disasters (including focus on mortality, morbidity, vax coverage, nutrition). Conduct applied research with view to quick implementation to guidance/changes in policy. Cover ALL hazards, competencies including in programme are comprehensive (found on website). **NIS:** Rare and imported pathogens laboratory (RIPL) Imported fever service, provides 24-hour, 7-day a week telephone access to expert clinical and microbiological advice to support management of febrile patients, infection control and public health interventions. 24 hour on-call molecular diagnostic service for viral haemorrhagic fevers and certain key differential diagnoses eg malaria, dengue. Next working day diagnostic service for a range of other acute imported fevers such as chikungunya and rickettsias. Panels of diagnostic tests designed for 10 world regions, with the aim of delivering a positive diagnosis rather than ruling out single infections - Field Epidemiology Training Programme (FETP) **PHE in Sierra Leone:** Support for development of incident specific plans in context of Sierra Leone for |

		potential outbreaks (eg Cholera, Polio, Ebola, Zika). Support provided through o Assisted to Sierra Leone Ministry of Health following outbreak of Ebola in Guinea in 2016, through proactive deployment of rapid response teams to bordering districts ▪ Followed draft response plans during incident, giving a solid reflection of advances present since previous Ebola response. o General technical support provided in Sierra Leone in EPRR and lab services. o Engaged in measures to enhance coordination between international partners, including: CDC (USA), CDC (China), WHO, UNDP, DfID and international NGOs • **ERD/EPRR**: International influence: Delivery of exercises for the World Health Organization (WHO), Food and Agricultural Organisation (UNFAO), the European Commission (EC), the European Centre for Disease Prevention and Control (ECDC) and USAID. • **CRCE**: REACHING OUT project - Horizon 2020 funded project, working with EU MS partners who are developing tools for use Internationally (ie Africa, Israel, Asia) However, the strategy for how these tools are embedded across UK (ie Disaster Recovery Tool (DRT)/ Psychological first aid tool/ Audio Visual Assessment Tool (AVA) is yet to be determined on how they will contribute to us (UK) in meeting strategic commitments to the Sendai Framework. The Disaster Recovery Tool (DRT) will provide evidence based guidance (decision makers and community level action) for the recovery and remediation of the environment following both natural or manmade disasters and crises. How information is accessed is also being investigated; it is likely that information will be provided by SMS, IVR, web application (HTML) and as a printed hard copy (back-up). EMETNET (European Multiple Environmental Emergencies Network) is an EU project part funded by DG ECHO (Directorate-General for European Civil Protection and Humanitarian Aid). However, the strategy for how the Rapid Risk Assessment (RRA), Impact Assessment Scale and Network of Experts will be embedded across UK is yet to be determined on how they will contribute to us (UK) in meeting strategic commitments to the Sendai Framework. Rapid risk assessment methodology for emerging environmental threats; Impact assessment of emerging environmental threats (health, environmental, economic and cross-sectoral impacts) to inform risk management, planning and response: o Note: Strategy for how the Rapid Risk Assessment (RRA); Impact Assessment Scale and Network of Experts will be embedded across UK is yet to be determined to enable UK to meet our strategic commitments to Sendai Framework. o Impact Assessment Scale for disasters.
34b	To promote the further development and dissemination of instruments, such as standards, codes, operational guides and other guidance instruments, to support coordinated action in disaster preparedness and response and facilitate information sharing on lessons learnedand best practices for policy practice and post-disaster reconstruction programmes;	• **Global Public Health:** Development and leadership on UK's Radiation Emergency Preparedness Service. Engaged in efforts with European Centre for Disease Prevention and Control (ECDC). PHE working with WHO-Geneva as part of international initiative to develop framework and associated function specific handbooks for public health emergency operations centres. • **PHE in Sierra Leone**: Support of implementation of WHO Strategic Tool for Prioritizing Risks (STAR) in Sierra Leone in October-November 2016. Led to identification of 46 specific strategic level risks within the country. Plans are in place to develop a program of consolidation, assign risk leads and set out preparedness mechanisms.

34c	To promote the further development of and investment in effective, nationally compatible, regional multi-hazard early warning mechanisms, where relevant, in line with the Global Framework for Climate Services, and facilitate the sharing and exchange of information across all countries;	• **GDRR**: EnhANcing emergencY management and response to extreme WeatHER and climate Events (ANYWHERE) (Horizon 2020), High Impact Weather Programme (HIWeather) (WMO)

34d	To enhance international mechanisms, such as the International Recovery Platform, for the sharing of experience and learning among countries and all relevant stakeholders;	• **CRCE COMAH**: PHE supports multi-agency emergency preparedness and response to incidents at COMAH sites:
		   ○ PHE staff participate in emergency plan exercises and revisions
		   ○ PHE has prepared internal resources (good practice guidance, maps and site-specific initial reference sheets), and contributed to HSE-led consultations on legislation and guidance.
		   ○ CRCE was part of the DG ECHO Cross-border Exposure characterisation for Risk Assessment in Chemical Incidents (CERACI) project. Related publication: Assessing and improving cross-border chemical incident preparedness and response across Europe
		   ○ Related publications/supporting evidence:
		      ■ Most relevant publication (HSE), contains overview of regime and brief mention of health/PHE role:
		         • A guide to the Control of Major Accident Hazards Regulations (COMAH) 2015
		      ■ PHE publications:
		         • Legislative developments: the Control of Major Accident Hazard Regulations 2015
		         • Part 1: COMAH and the role of Public Health England
		         • Part 2: Public health information in COMAH off-site emergency plans
		         • Review of incidents occurring at COMAH sites in England and Wales, January 2009 – June 2011
		         • Lessons learnt from a COMAH site exercise: A public health trainee's view
		         • A review of Health Protection Agency involvement in incidents occurring at sites regulated under the Control of Major Accident Hazards (COMAH) Regulations D10:D19
		• **PHE in Sierra Leone**: Engaged in measures to enhance coordination between international partners, including: CDC (USA), CDC (China), WHO, UNDP, DfID and international NGOs.

34e	To support, as appropriate, the efforts of relevant United Nations entities to strengthen and implement global mechanisms on hydrometeorological issues in order to raise awareness and improve understanding of water-related disaster risks and their impact on society, and advance strategies for disaster risk reduction upon the request of States;	• **Extreme Events & GDRR:** Providing health related expertise and knowledge on three University of Reading projects:
		  o Forecasting Rainfall exploiting new data Assimilation techniques and Novel observations of Convection (FRANC)
		  o Susceptibility of catchments to INTense RAinfall and flooding (SINATRA)
		  o Towards END-to End flood forecasting and a tool for ReaL-time catchment susceptibility (TENDERLY)

34f	To support regional cooperation to deal with disaster preparedness, including through common exercises and drills;	• **ERD:** Selection of Off The Shelf Exercises (OTSE) available, all are designed for health concerns in an English setting, but with an element of multi-agency engagement. Current OTSE titles include: Business Continuity, Chemical Hazmat, Burns, Communicable Disease, Hospital Evacuation, Pandemic Influenza, Viral Haemorrhagic Fever, Winter Pressures and Mass Casualty. Further OTSE are currently under development including Heat Wave, Fuel Disruption and Nursing Home Evacuation.
		  o July 2016 Flyer for OTSE
		  o All are designed for health concerns in an English setting, but with an element of multi-agency engagement.
		• **PHE in Sierra Leone**: Enabled collaborative activity between national emergency preparedness actors in Sierra Leone and region. Organised visits to examine EOC structure and methods, and to develop a common framework for capacity building in the region.

34g	To promote regional protocols to facilitate the sharing of response capacities and resources during and after disasters;	• **PHE in Sierra Leone**: Enabled collaborative activity between national emergency preparedness actors in Sierra Leone and region. Organised visits to examine EOC structure and methods, and to develop a common framework for capacity building in the region. Establishment of FETP training packages across academic and governmental institutions several countries in West Africa. Aim to work with WHO AFRO to roll out in the AFRO region more widely.

34h	To train the existing workforce and volunteers in disaster response.	• **PHE Health Protection**: UK Public Health Rapid Support Team (RST) announced in November 2016, consisting of clinicians, scientists and academics, can be deployed to tackle outbreaks of disease anywhere in the world within 48 hours. They will be on call to respond to urgent requests from countries around the world and fly in to help tackle disease outbreaks at source. Activities include undertaking a rapid risk assessment when on mission in country. Working across the WHO led global public health rapid response team network to standardise operational arrangements, training and pre-deployment approval mechanisms.
		• **PHE in Sierra Leone**: Formation of Public Health National Emergency Operations Centre (PHNEOC) as part of follow up response to Ebola
		  o Group coordinates response measures in public health events and acts as a central repository.
		  o Office of capacity c.50 is located in Freetown, Sierra Leone, with PHE carrying out FETP program trainings there.

		- o Roughly 500 Ministry of Health staff have been trained in emergency management and EOC functionality thus far. - o Routine outputs of centre include: quarterly newsletters and information dissemination. - Proactive in improving capacity through - o Improved diagnostic/reference laboratory capacity through building of new labs in Makeni (2015) and Bo (2016) in Sierra Leone, with refurbishment of another in Connaught scheduled to begin in May 2017. - o Improved human capacity via mentorship and training programs provided for national laboratory staff in Sierra Leone - o Agreement between Emory University, USA and Njala University, Sierra Leone to investigate training and support programs for graduates. Gave PHE opportunity to develop and put in place a support program for ongoing development of capacity of early stage professionals in country (eg through engagement in lab settings) - o Specific efforts in place which are developing certificate diplomas and masters degree level training in resilience and response in Sierra Leone. - o Program in place for Sierra Leone national to undertake diploma in national emergency planning at Loughborough University. - o Establishment of FETP training packages across academic and governmental institutions several countries in West Africa. Aim to work with WHO AFRO to roll out in the AFRO region more widely. - o Provision of bursaries by PHE/LSHTM for short course attendance by employees of the Government of Sierra Leone supporting work related to Global Health Security and Emergency Preparedness and response.

Annex 3: list of contributors

The list of contributors includes the following PHE professionals and their role at the time of their contribution to the review:

Alec Dobney, Head of Unit, Environmental hazards and Emergencies Department.
Alex Elliot, National Scientist Lead (Syndromic Surveillance).
Angie Bone, Head of Extreme Events and Health Protection.
Anna Sasiak, Specialist in Workforce Development.
Anne Brice, Head of Knowledge Management.
Ann-Marie Connolly, Director of Health Equity and Mental Health.
Brian McCloskey, Director of WHO Collaborating Centre for Mass Gatherings and High Consequence, High Visibility Events
Bernie Hannigan, Director Research, Translation & Innovation, Chief Knowledge Officer.
Carl Petrokofsky, Specialist in Public Health, Health Equity and Impact.
David Pencheon, Director - Sustainable Development Unit (SDU).
Debra Lapthorn, Centre Director South West.
Deb McKenzie, Director of Organisational & Workforce Development Directorate, CEO.
Derrick Crook, Director of Microbiology.
Dilys Morgan, Head, Emerging Infections and Zoonoses.
Elaine Rashbrook, National Lead for Older People, Interim Lead for Adults, NCD Global Health Lead. Emma-Jane Good, Health Protection Scientist, Chemicals and Poisons Department, Centre for Radiation, Chemical and Environmental Hazards.
Fu-Meng Khaw, Director, Public Health England East Midlands.
Gary Dade, Strategic Business Continuity Manager ERD.
Gillian Smith, Consultant Epidemiologist Real Time Syndromic Surveillance Team.
Graham Bickler, South East Regional Director.
Gregor Henderson, Director, Wellbeing and Mental Health, Wellbeing and Mental Health.
Helen McIntyre, HPRU lead for Patient and Public Involvement and Engagement.
Isabel Oliver, Director, Field Epidemiology Service.
Jan Nixon, Senior Campaign Manager.
Jill Meara, Acting Director CRCE.
Joanne Bosanquet, Deputy Chief Nurse.
Jolyon Medlock, Lead Medical Entomology Group.
John Newton, Chief Knowledge Officer.
Jurgen Schmidt, Principal Epidemiologist. Chief Knowledge Officer.
Julian Brookes, Deputy Chief Operating Officer, Operations.
Karen Reddin, Strategic Emergency Planning Manager.
Kevin Blanchard, Senior Environmental Scientist in Global Disaster Risk Reduction.
Kevin Fenton, National Director, Health and Wellbeing.

Laura Woodward, Senior Communications Manager, Emergency Response.
Lee Bailey, Director of Comms, communications.
Lesley Prosser, Head of Radiation Hazards and Emergencies Department.
Maria Zambon, Director, Reference Microbiology.
Margaret Mauchline, Health of Internal Research.
Mark Keilthy, Head of International Public Health.
Mark Salter, Global Health Consultant.
Mary Ramsay, Consultant Epidemiologist and Head, Immunisation, Hepatitis and Blood Safety.
Michael Edelstein, Consultant Epidemiologist, Immunisation, Hepatitis and Blood Safety Department, National Infection Service.
Miles Carroll, Deputy Director, Head of MS Research.
Naima Bradley, Head of Environmental hazards and emergencies Dept.
Neil Squires, Director of Global Public Health.
Nick Phin, Interim Director for Centre for Infectious Disease Surveillance and Control.
Owen Landeg, Environmental public health scientist, Extreme Events.
Paul Cosford, Director for Health Protection and Medical Director.
Paul Sutton, Interim Director – EPRR. Peter Bradley, Director of Knowledge and Intelligence.
Raquel Duarte-Davidson, Head of Chemicals and Poisons Department, CRCE.
Rashmi Shukla, Regional Director, Midlands and East of England.
Raymond Jankowski, Head of Healthcare Public Health, Healthcare Public Health.
Richard Amlot, Scientific Programme Leader, Behavioural Science, ERD.
Rishma Maini, Public Health Registrar.
Robie Kamanyire, Head of unit, CRCE.
Ruth Ruggles, Head of Public Health & Epidemiology Training.
Shona Arora, National workforce development lead, Organisational and Workforce Development. Simon Bouffler, Head of Radiation Effects Department, CRCE.
Simon Mann, Head of Radiation Dosimetry Department (CRCE).
Sotiris Vardoulakis, Head of the Environmental Change Department at the Centre for Radiation, Chemical & Environmental Hazards.
Stacey Wyke, Group Leader, Chemicals & Poisons Department. Steve Leach, Scientific Programme Head, Emergency Response Department Science and Technology (ERD S&T).
Sue Ibbotson, Centre Director - West Midlands.
Tazeem Bhatia, Public Health Registrar.
Thomas Waite, Consultant in Extreme Events and Health Protection.
Tina Endericks, Director WHO Collaborating Centre for Mass Gatherings and Global Health Security.
Tim Gant, Head of toxicology.
Virginia Murray, Consultant in Global Disaster Risk Reduction.
Wendy Nicholson, Lead Nurse - Children, young people and families.