



Public Health  
England

United Nations University-International Institute for Global Health (UNU-IIGH)  
Symposium on the Health Impacts of Floods 26 October 2015

# The Sendai Framework for Disaster Risk Reduction 2015-2030 and Health Impacts of Flooding

Professor Virginia Murray

*Consultant in Global Disaster Risk Reduction, Public Health England*

*Vice-chair UNISDR Science and Technical Advisory Group*



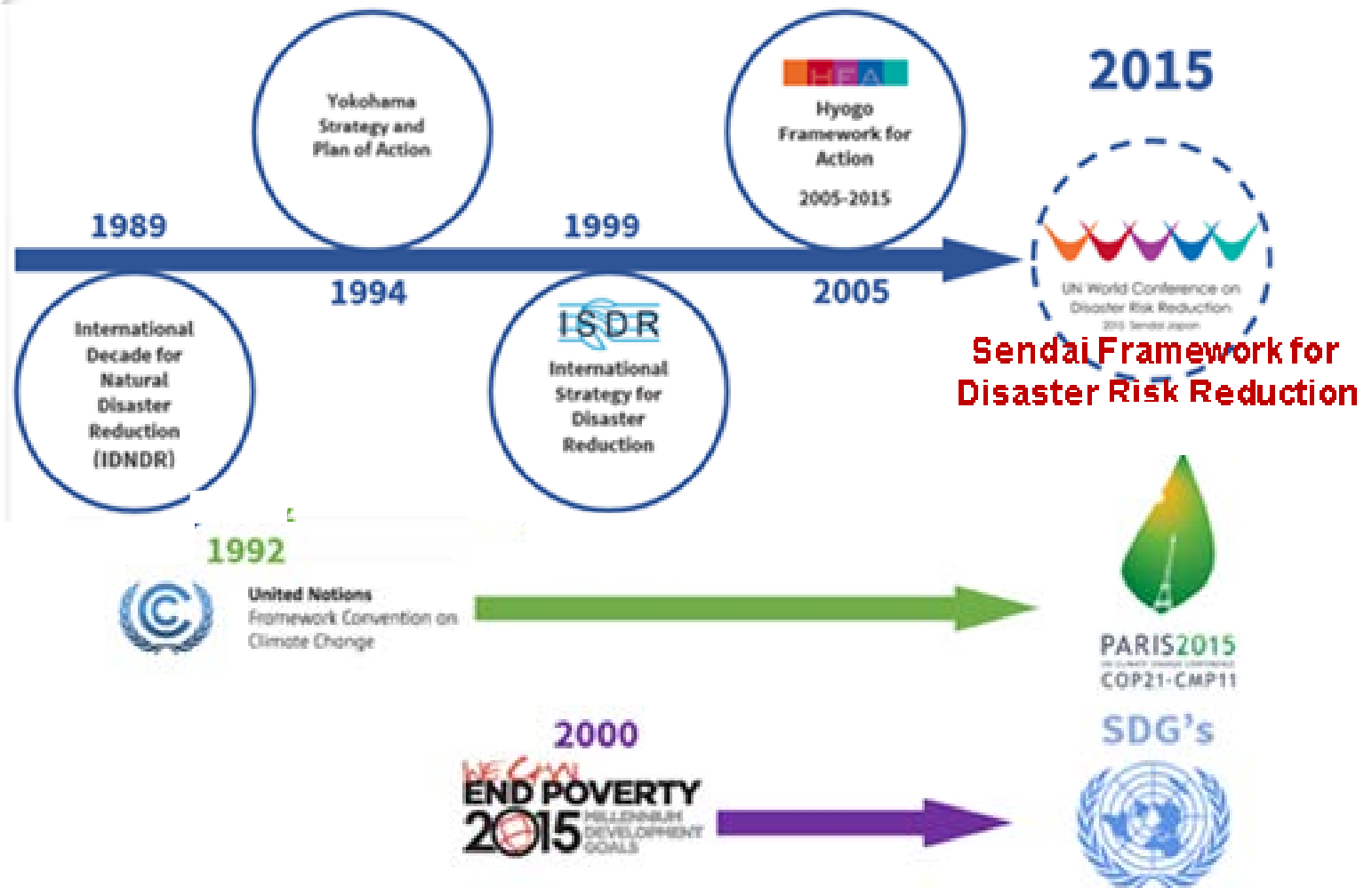
Scientific and Technical Advisory Group

**WHO Regional Office for Europe**  
**Prevention, preparedness and response to reduce**  
**or avoid health effects of flood events**  
**Bonn 19-20 October 2015**

## **The Sendai Framework on Disaster Risk Reduction 2015-2030**

*Professor Virginia Murray, Vice-chair of UNISDR STAG*  
*Public Health Consultant in Global Disaster Risk Reduction*  
*Public Health England*

# Why 2015 matters so much





International Strategy for Disaster Reduction

HFA



# Hyogo Framework for Action 2005 - 2015: Building the Resilience of Nations and Communities to Disasters

<http://www.unisdr.org/eng/hfa/docs/HFA-brochure-English.pdf>

# United Nations

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# Plan of Action on

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# Disaster Risk

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# Reduction for

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# Resilience

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United Nations System  
Chief Executives Board for Coordination



Plataforma Regional para la Reducción del Riesgo de Desastres de las Américas

Invertir en RRR

IV Sesión - Guayaquil



The 6<sup>th</sup> Asian Ministerial Conference on Disaster Risk Reduction  
Bangkok, Kingdom of Thailand 22 – 26 June 2014

Unedited English Translation\*

## Second Arab Conference for Disaster Risk Reduction

Sharm El



We, the Arab Ministers  
representatives of regional  
participating in the Second  
14-16 September 2014, ex

Asia and the Pacific 2014

countries of Asia and the Pacific,  
reduction (AMCDRR) in Bangkok,

ers in the Asia-Pacific, including  
China and India; earthquakes in  
creasing number of medium and  
ironmental losses in the region;  
already experiencing increased

tions,  
Egypt  
its



## 5<sup>th</sup> EUROPEAN FORUM FOR DISASTER RISK REDUCTION

### Madrid Outcomes

6-8 October 2014

Champion, reinforce and better connect existing and future initiatives for integrated research and the scientific assessment of disaster risk through an adequate international scientific advisory mechanism, in order to **strengthen the evidence base to inform decision-making under the post-2015 framework.**







# UNISDR

The United Nations Office for Disaster Risk Reduction

Conne

WHO WE ARE ▾

WHAT WE DO ▾

WHERE WE WORK ▾

WHO WE WORK WITH ▾

HOME

NEWS ARCHIVE

## World Conference adopts new international framework for disaster risk reduction after marathon negotiations

**18 March 2015, SENDAI** – Representatives from **187 UN member States** today adopted the first major agreement of the Post-2015 development agenda, a far reaching new framework for disaster risk reduction with **seven targets** and **four priorities for action**.

Sendai Framework

<http://www.unisdr.org/archiv>



# Sendai Framework for Disaster Risk Reduction 2015 - 2030



# Sendai Framework for Disaster Risk Reduction 2015-2030

Main result of the 3<sup>rd</sup> UN World Conference on DRR, Sendai, March 2015

Outcome:

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.



# Sendai Framework for Disaster Risk Reduction 2015-2030

## Seven global targets

1. Substantially **reduce global disaster mortality** by 2030, aiming to lower average per 100,000 global mortality between 2020-2030 compared to 2005-2015.
2. Substantially **reduce the number of affected people** globally by 2030, aiming to lower the average global figure per 100,000 between 2020-2030 compared to 2005-2015
3. Reduce **direct disaster economic loss** in relation to global gross domestic product (GDP) by 2030.
4. Substantially **reduce disaster damage to critical infrastructure** and disruption of basic services, among them **health and educational facilities**, including through developing their resilience by 2030.



# Sendai Framework for Disaster Risk Reduction 2015-2030

## Seven global targets (cont)

5. Substantially increase the number of countries with **national and local disaster risk reduction strategies** by 2020.
6. Substantially enhance **international cooperation to developing countries** through adequate and sustainable support to complement their national actions for implementation of this framework by 2030.
7. Substantially increase the availability of and access to **multi-hazard early warning systems and disaster risk information and assessments** to the people by 2030.



# Sendai Framework for Disaster Risk Reduction 2015-2030

## Four priorities for action

1. **Understanding disaster risk;**
2. Strengthening disaster risk **governance** to manage disaster risk;
3. **Investing** in disaster risk reduction for resilience;
4. Enhancing disaster preparedness for **effective response**, and to “Build Back Better” in recovery, rehabilitation and reconstruction.

- i) *at National and Local Levels*
- ii) *at Global and regional levels*



# Public health paragraphs

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# Priority 3. Investing in disaster risk reduction for resilience

## 30 i) National and local

- (i) 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; and **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







194 countries  
implemented when  
entered into force on  
15 June 2007

<http://www.who.int/ihr/9789241596664/en/index.html>

INTERNATIONAL HEALTH REGULATIONS | 2005 |

Second Edition

# INTERNATIONAL HEALTH

## REGULATIONS

(2005)

SECOND EDITION




World Health  
Organization

# Priority 3. Investing in disaster risk reduction for resilience

30 k) National and Local

- (k) 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**;





Priority 4: **Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction** - 33 – national and local

- (o) Enhance recovery schemes to provide **psychosocial support and mental health services** for all people in need;





Priority 4: **Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction** - 33 – national and local

- (n) Establish a **mechanism of case registry** and a **database of mortality caused by disaster in order to improve the prevention of morbidity and mortality;**



# Priority 3. Investing in disaster risk reduction for resilience

## 31e) Global and regional

- (e) 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;



# Science and technical paragraphs

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- (k) In the post-disaster recovery, rehabilitation and reconstruction, the creation of and to reduce disaster risk by "Building B education" and awareness of disaster risk;
- (l) An effective and meaningful global partnership and international cooperation, including the fulfilment of res development assistance by developed countries, are es management;
- (m) Developing countries, in particular the least developed c States, landlocked developing countries and African co and other countries facing specific disaster risk challenges timely provision of support, including through finance, to building from developed countries and partners tailored identified by them.

#### IV. Priorities for action

20. Taking into account the experience gained through the Framework for Action, and in pursuance of the expected outco focused action within and across sectors by States at local, nati the following four priority areas:

**Priority 1: Understanding disaster risk**

**Priority 2: Strengthening disaster risk governance to mana**

**Priority 3: Investing in disaster risk reduction for resilience**

**Priority 4: Enhancing disaster preparedness for effective re in recovery, rehabilitation and reconstruction**

21. In their approach to disaster risk reduction, States, regiona and other relevant stakeholders should take into consideratio each of these four priorities and should implement them, as appr respective capacities and capabilities, in line with national laws

22. In the context of increasing global interdependence, concer enabling international environment and means of implementat contribute to developing the knowledge, capacities and motiva all levels, in particular for developing countries

##### Priority 1: Understanding disaster risk

23. Policies and practices for disaster risk management shoul of disaster risk in all its dimensions of vulnerability, capacity, hazard characteristics and the environment. Such knowledge o of pre-disaster risk assessment, for prevention and mitigatio implementation of appropriate preparedness and effective res

##### National and local levels

24. To achieve this, it is important:

- (a) To promote the collection, analysis, management and use information and ensure its dissemination, taking into account of users, as appropriate;
- (b) To encourage the use of and strengthening of baselines risks, vulnerability, capacity, exposure, hazard character effects at the relevant social and spatial scale on ec circumstances;

(c) To develop, periodically update and disseminate, as appropriate, location-ba information, including risk maps, to decision makers, the general public a at risk of exposure to disaster in an appropriate format by using, as appli information technology;

(d) To systematically evaluate, record, share and publicly account for dis understand the economic, social, health, education, environmental and impacts, as appropriate, in the context of event-specific hazard-exposure i information;

(e) To make non-sensitive hazard-exposure, vulnerability, risk, disaster and los information freely available and accessible, as appropriate;

(f) To promote real time access to reliable data, make use of space and in including geographic information systems (GIS), and use information and technology innovations to enhance measurement tools and the collect dissemination of data;

(g) To build the knowledge of government officials at all levels, civil society t volunteers, as well as the private sector, through sharing experiences, good practices and training and education on disaster risk reduction, incl existing training and education mechanisms and peer learning;

(h) To promote and improve dialogue and cooperation among scientific ai communities, other relevant stakeholders and policymakers in order to fat policy interface for effective decision-making in disaster risk management

(i) To ensure the use of traditional, indigenous and local knowledge at appropriate, to complement scientific knowledge in disaster risk asse development and implementation of policies, strategies, plans and progral sectors, with a cross-sectoral approach, which should be tailored to loca context;

(j) To strengthen technical and scientific capacity to capitalize on and can knowledge and to develop and apply methodologies and models to asse vulnerabilities and exposure to all hazards;

(k) To promote investments in innovation and technology development in li hazard and solution-driven research in disaster risk management to address interdependencies and social, economic, educational and environmental disaster risks;

(l) To promote the incorporation of disaster risk knowledge, including disa mitigation, preparedness, response, recovery and rehabilitation, in formal education, as well as in civic education at all levels, as well as in professio training;

(m) To promote national strategies to strengthen public education and awar risk reduction, including disaster risk information and knowledge, thro social media and community mobilization, taking into account specific aut needs;

(n) To apply risk information in all its dimensions of vulnerability, capacity i persons, communities, countries and assets, as well as hazard character and implement disaster risk reduction policies;

(o) To enhance collaboration among people at the local level to dissemin information through the involvement of community-based organizta governmental organizations;

#### Global and regional levels

25. To achieve this, it is important:

(a) 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;

(b) 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;

(c) 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;

(d) 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;

(e) 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;

(f) 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;

(g) 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 Terminology on Disaster Risk Reduction"; use post-disaster reviews as opportunities to enhance learning and public policy; and disseminate studies;

(h) To encourage the availability of copyrighted and patented materials, including through negotiated concessions, as appropriate;

(i) 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;

# Priority 1 Understanding Disaster Risk

25 (g) **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 all regions with the support of the UNISDR Scientific and Technical Advisory Group in order to:**





# Priority 1 Understanding Disaster Risk – 25 g}

- strengthen the **evidence-base** in support of the implementation of this framework;
- promote **scientific research of 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;



# Priority 1 Understanding Disaster Risk – 25 g}

- 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 2009 **UNISDR Terminology** on Disaster Risk Reduction;
- use **post-disaster reviews** as opportunities to enhance learning and public policy; and disseminate studies





## VI. International cooperation and global partnership

### Means of implementation

#### Paragraph 47

- (c) Promote the use and expansion of thematic platforms of cooperation such as **global technology pools** and global systems to share know-how, innovation and research and to ensure access to technology and information in disaster risk reduction.





# UNISDR

—The United Nations Office for Disaster Risk Reduction—


## **UNISDR Science and Technology Conference on the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030**

*To promote and support the availability and  
application of science and technology to  
decision-making in Disaster Risk Reduction*

27-29 January 2016

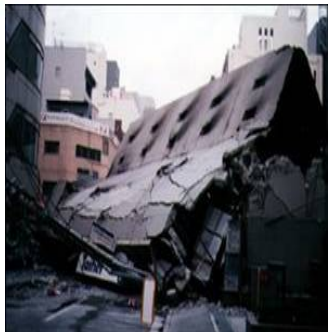
Geneva International Conference Centre





# UNISDR Science and Technology Conference on the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030

- launch the **UNISDR Science and Technology Partnership** for the implementation of the Sendai Framework,
- discuss and endorse the **UNISDR Science and Technology road map to 2030** to define the expected outcomes of the science and technology work under each of the four Sendai Framework priorities for actions and the ways to monitor progress and review emerging needs



# UNISDR SCIENCE AND TECHNOLOGY CONFERENCE ON THE IMPLEMENTATION OF THE SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION 2015-2030

27-29 JANUARY 2016 | GENEVA, SWITZERLAND


## ABOUT THE CONFERENCE

The conference aims to bring together the full diversity of the science and technology community, policy makers, practitioners and researchers from all geographical regions, at local, national, regional and international levels to discuss how the science and technology community will best support the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030.

The UNISDR Science and Technology Conference on the implementation

## PRACTICAL INFORMATION

 **Registration now open**


 Practical Information

## KEY DOCUMENTS


 The Sendai Framework for Disaster Risk Reduction: the challenge for science Conclusions and recommendations of a meeting at the Royal Society on 24 – 25 June 2015


 2015 STAG report

 2013 STAG report

 UNISDR scientific and technical advisory group

## CONFERENCE UPDATES

 Save the Date

 Draft Agenda

 Concept Note

 Conference Co-Organizers

# Conference Co-Organizers



European Commission Joint Research Centre (EC-JRC)



Integrated Research on Disaster Risk (IRDR)



International Council for Science (ICSU)



Global Earthquake Model Foundation (GEM)



World Health Organization (WHO)



The Global Network of Science Academies (IAP)



Global Facility for Disaster Reduction and Recovery (GFDRR)



Public Health England

Public Health England (PHE)



Science Council of Japan (SCJ)



United Nations Educational, Scientific and Cultural Organization (UNESCO)



United Nations University (UNU)



World Meteorological Organization (WMO)

# Conference topics

Work stream 1: **The Scientific and Technical Partnership to support the implementation of the Sendai Framework**

Work stream 2: **Understanding disaster risk, risk assessment and early warning**

Work stream 3: **Use of Science, technology and innovation tools, methods, and standards**

Work stream 4: **Leveraging science through capacity development and research**





# Side events

- **Young scientists**
- **Ethics and science**
- **Publishing science**
- **Women in science**
- **Funders of science**



# The Sendai Framework on Disaster Risk Reduction 2015-2030

- key to developing more effective disaster risk reduction for health impacts from flooding in Europe
- increased focus on health, science and technology in disaster risk management
- identifying the research and innovation needs are essential – join us in Geneva in January 2016





Public Health  
England

United Nations University-International Institute for Global Health (UNU-IIGH)  
Symposium on the Health Impacts of Floods 26 October 2015

# The Sendai Framework for Disaster Risk Reduction 2015-2030 and Health Impacts of Flooding

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*Vice-chair UNISDR Science and Technical Advisory Group*

# Developing a Health System Approach to Disaster Management: A Qualitative Analysis of the Core Literature to Complement the WHO Toolkit for Assessing Health-System Capacity for Crisis Management

August 22, 2012 · Research article

Dr Claire Bayntun<sup>1</sup>, Gerald Rockenschaub<sup>2</sup>, Virginia Murray<sup>3</sup>

1 WHO Collaborating Centre for Mass Gatherings and Extreme Events, Health Protection Agency, London, 2 World Health Organization (WHO) Regional office for Europe, Copenhagen, Denmark, 3 Head of Extreme Events and Health Protection, Health Protection Agency, London UK

Bayntun C, Rockenschaub G, Murray V. Developing a Health System Approach to Disaster Management: A

<http://currents.plos.org//disasters/article/developing-a-health-system-approach-to-disaster-management-a-qualitative-analysis-of-the-core-literature-to-complement-the-who-toolkit-for-assessing-health-system-capacity-for-crisis-management/pdf>



World Health  
Organization

REGIONAL OFFICE FOR  
Europe

# Assessment of health-system crisis preparedness



# England



Public Health  
England



Cabinet Office

# National Risk Register of Civil Emergencies

2015 edition

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/419549/20150331\\_2015-NRR-WA\\_Final.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/419549/20150331_2015-NRR-WA_Final.pdf)



# National Risk Register 2015

## Risk matrix

Figure 1: Risks of terrorist and other malicious attacks

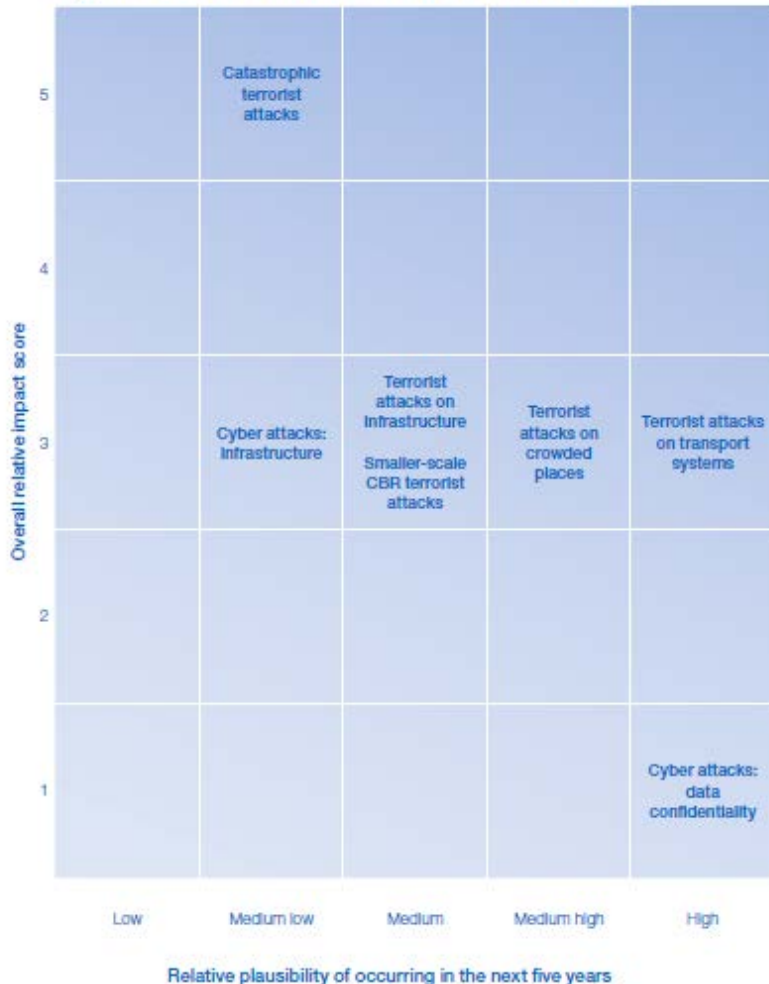
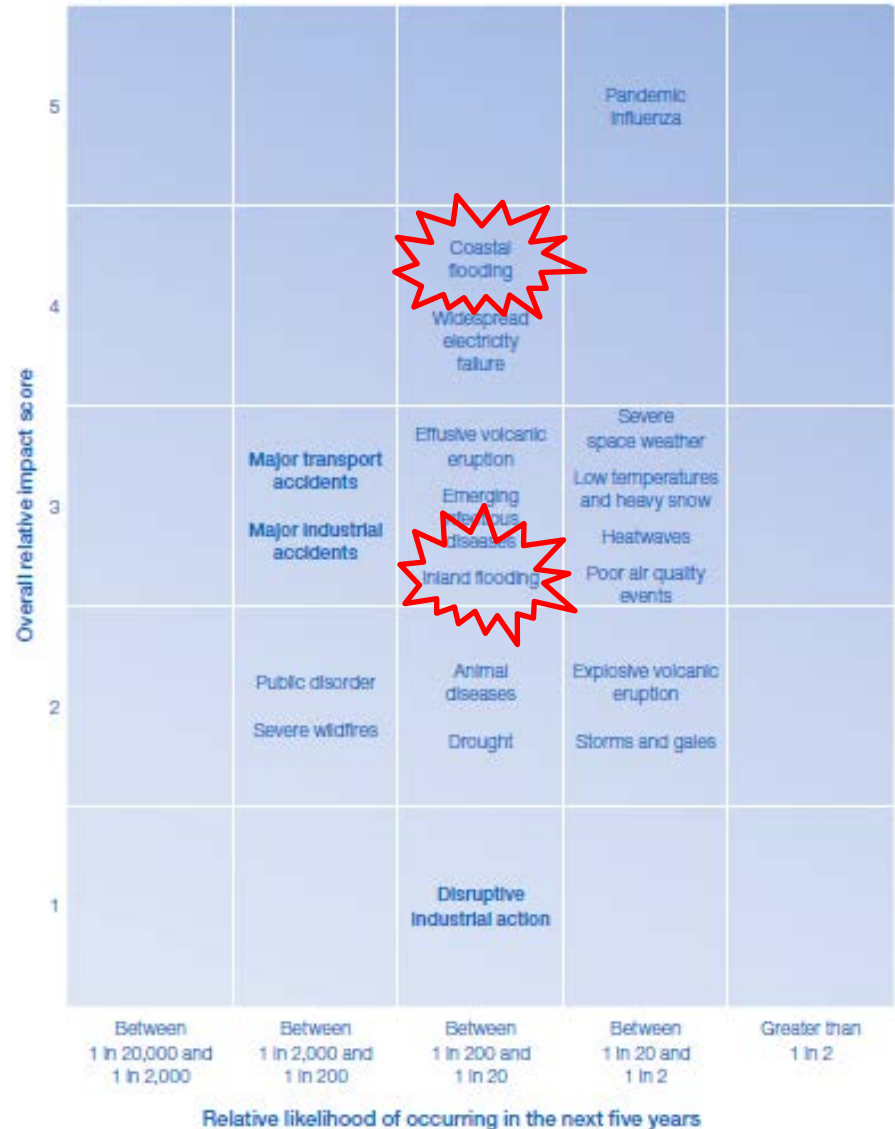


Figure 2: Other risks





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## Primarily:

- **Heat**
- **Cold**
- **Floods**

## But also:

- Drought
- Wildfires
- Landslides
- Windstorms
- Earthquakes
- Tsunamis
- Space weather...







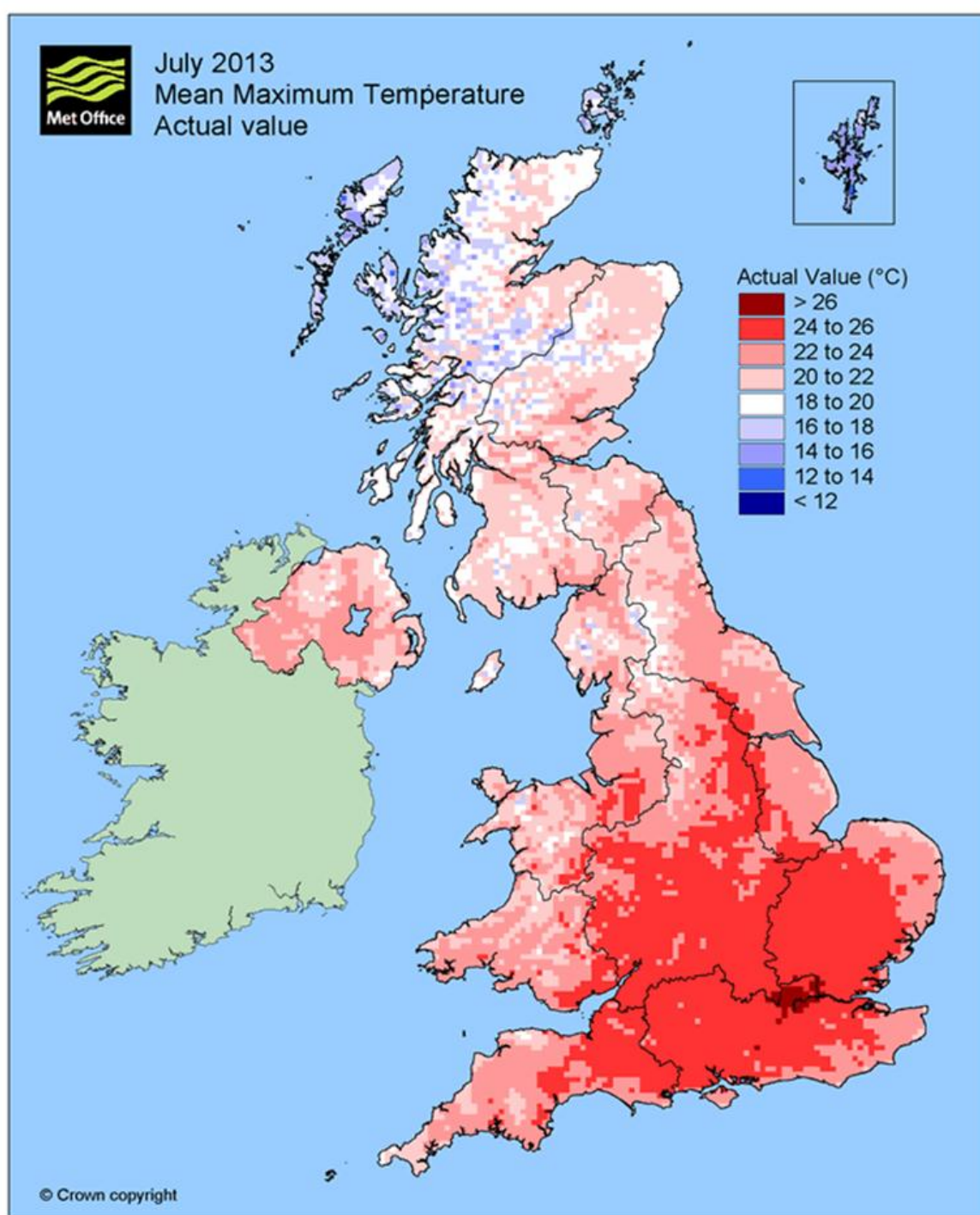


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Courtesy of the Met Office

# July 2013 Mean Maximum Temperature

<http://www.metoffice.gov.uk/climate/uk/summaries/anomacts>





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# Heatwave Plan for England 2013

<https://www.gov.uk/government/publications/heatwave-plan-for-england-2013>



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**NHS**  
England



Local  
Government  
Association

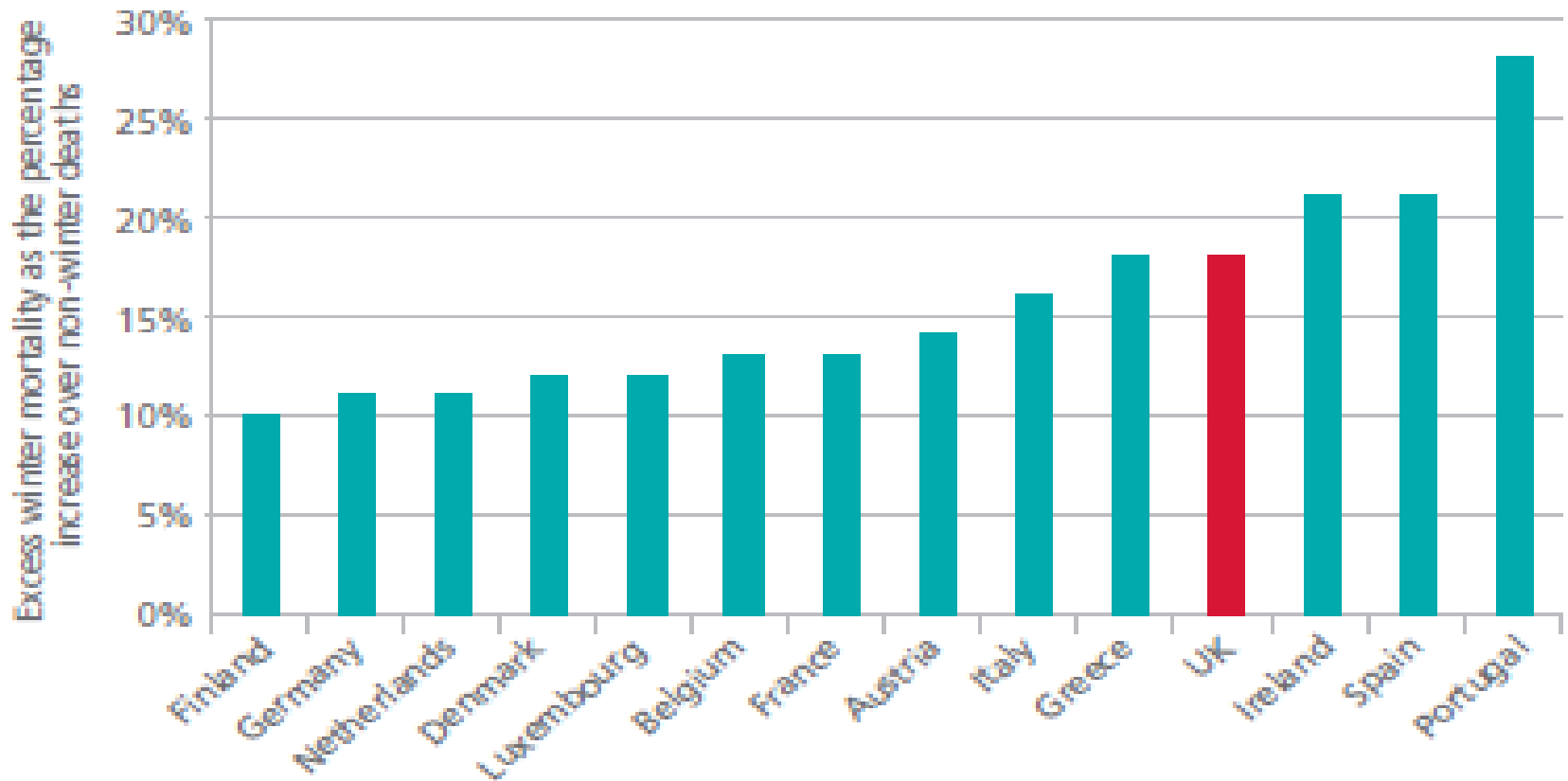
Met Office





# Excess Winter Mortality

**Figure 2: Excess winter mortality by country**



Source: Healy JD. Excess winter mortality in Europe: a cross country analysis identifying key risk factors. *Journal of Epidemiology and Community Health* 2003; 57(10): 784-9



Public Health



Public Health

**NHS**  
England



Public Health  
England

**ageUK**  
Love later life

**NHS**

Cold Weather Plan For England  
Making the Case: Why long  
strategic planning for cold  
essential to health and well



Plan for England  
reducing harm



October 2015

## Top tips for keeping warm and well

Cold weather can be bad for our health, especially for people aged 65 and older. As we age it takes longer to warm up, which raises the risk of increased blood pressure, heart attacks and strokes.

There are easy things you can do to help yourself stay healthy over the winter ▶▶

**Local**  
Government  
Improving lives

**Met Office**





Public Health  
England

# UK Floods 2007



- Yorkshire, Humberside, West Midlands, South West, South East
- 55,000 properties flooded;
- 7,000 people rescued from flood waters by emergency services
- 13 people died
- 350,000 people lost mains water supply for 17 days
- 42,000 people were without electricity for up to 24 hours
- 10,000 people were trapped on the M5 motorway
- Tewkesbury hospital was evacuated and 20 patients transferred to other hospitals

(Pitt review '08: review of multi-agency response)

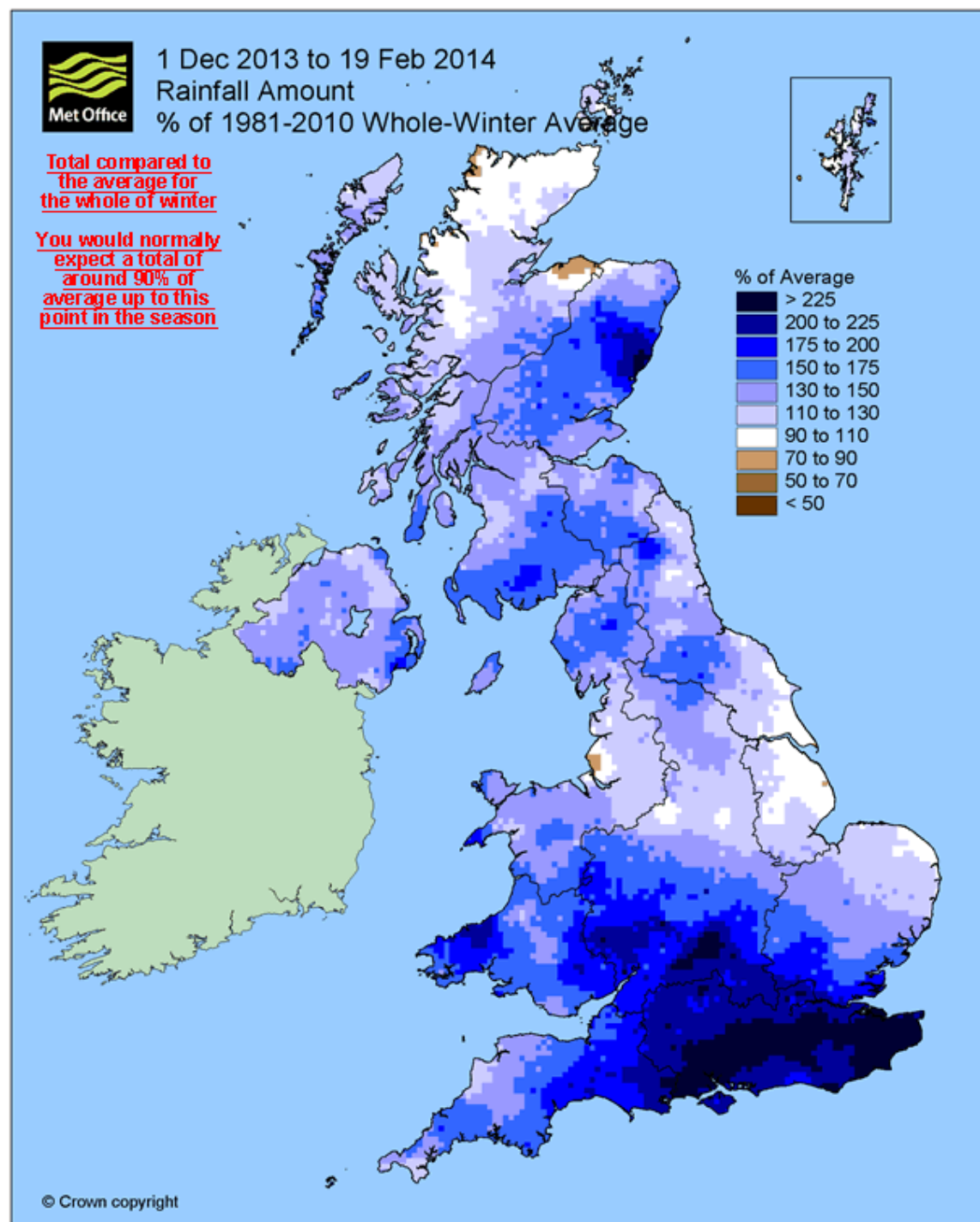




Public Health  
England

# Rainfall percentage average 1 December 2013 – 19 February 2014

Courtesy of the Met  
Office





## Properties flooded since the start of December 2013



Approximate numbers of properties flooded (Environment Agency figures)

**Early December (Coastal): 2,600**

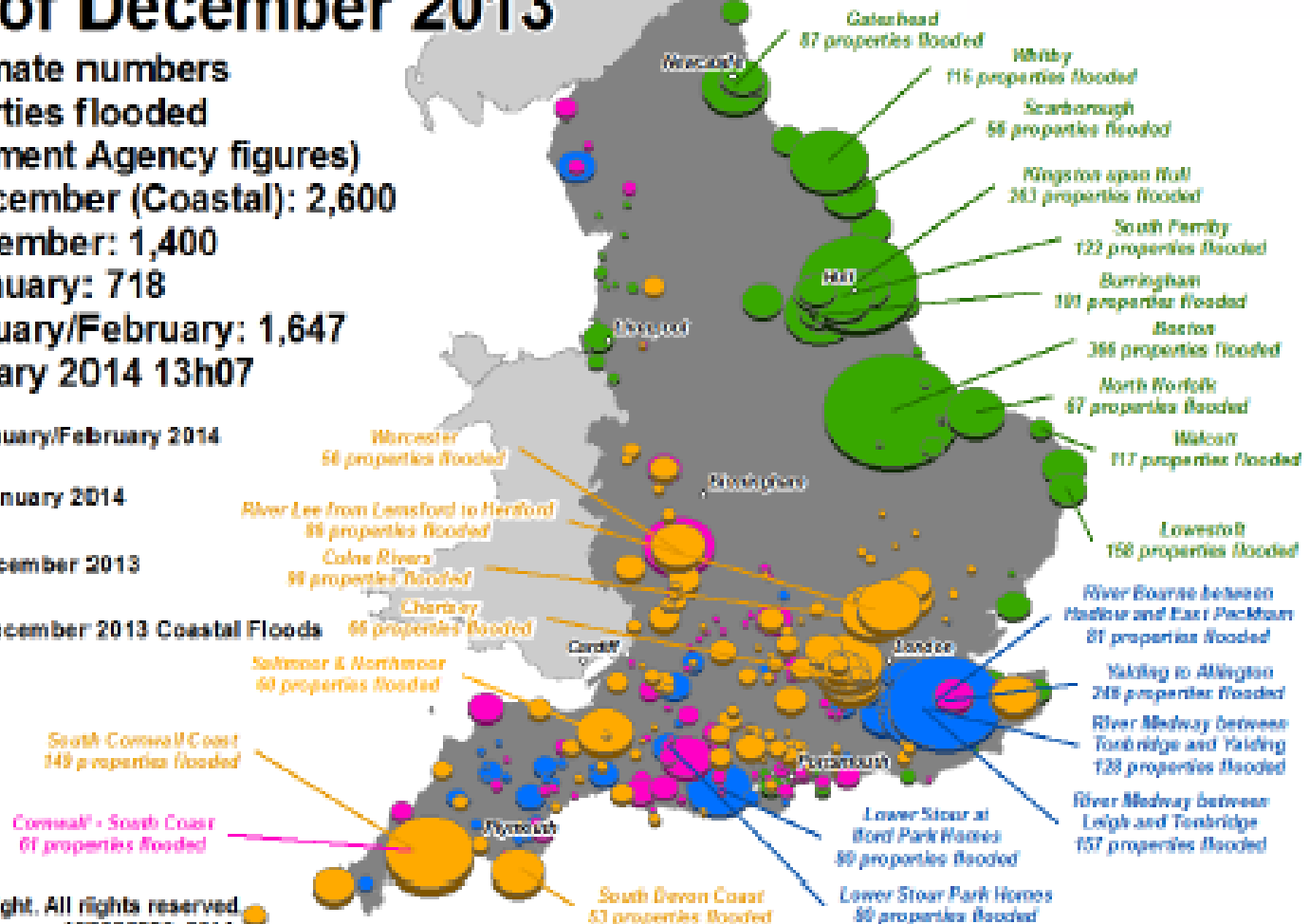
**Late December: 1,400**

**Early January: 718**

**Late January/February: 1,647**

**16 February 2014 13h07**

-  Late January/February 2014
-  Early January 2014
-  Late December 2013
-  Early December 2013 Coastal Floods





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# WHO / PHE report Floods: Health effects and prevention in the WHO European Region

<http://www.euro.who.int/en/what-we-publish/abstracts/floods-in-the-who-european-region-health-effects-and-their-prevention>

## FLOODS IN THE WHO EUROPEAN REGION: HEALTH EFFECTS AND THEIR PREVENTION





# Health impacts of flooding

## Acute health effects

Associated with flood water and its debris:

- **Drowning** (walking or driving through flood water)
- **Physical trauma** (concealed or displaced objects; electrocution, fire)
- **Other health effects** such as heart attacks

## Longer-term health effects

Occur as a consequence of flooding:

- **Mental health impacts** (secondary stressors)
- **Carbon monoxide poisoning**
- **Skin & gut infections** from contaminated flood water
- **Respiratory disease** from mould & damp
- **Rodent-borne disease**





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# Other health effects

- Population displacement
- Disrupted water, power and food supplies
- Damage to infrastructure, including health care facilities





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# Vulnerability to health impacts of floods

Children

Pregnant women

Physical impairments

Sensory impairments

Cognitive impairments

Elderly

Chronic illnesses

Tourists

Homeless

Cultural and language based  
vulnerabilities (weak  
social networks)

Little awareness of public  
warnings and guidance

High risk built environment



Public Health



Public Health  
England

Protecting and improving the nation's health



In partnership with  
Environment  
Agency



Department  
for Environment  
Food & Rural Affairs

www.gov.uk/defra

## The National Flood Emergency

### Framework for England

# Flooding: Advice for the public

Advice on:

## If a flood has been forecast



If flooding has been forecast where you live, listen to local radio or check:

[www.gov.uk/check-if-youre-at-risk-of-flooding](http://www.gov.uk/check-if-youre-at-risk-of-flooding)

If you have questions phone your local authority or

Floodline: 0345 988 1188.

Pack a 'flood kit' in case you need to leave your home:



Phone numbers,  
insurance  
documents,  
bank cards and  
money.



Medicines and  
medical devices,  
hearing aid  
batteries, glasses  
and contact  
lenses.



Clothing,  
toothbrush and  
personal items.



If you have a  
baby, pack  
nappies, clothing  
and baby food.



NHS '111' for non-urgent |  
Food Standards Agency



Know how to turn off your gas, electricity and water before flood water enters your home. Phone your local suppliers if you are unsure how to do this.

Environment  
Agency





# Some challenges in understanding health effects of flooding

- Existing literature: heterogeneity of flood events, definitions, data collected, study designs
- Exposure assessment: flood water, disruption
- Outcome measurement: type, data collection method, time
- Modifiers: type of flood, population group, interventions
- Limitations of routine data: linking exposure to outcome (spatial/temporal); scale
- Challenges of setting up prospective studies: size, duration, follow-up, cost







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# PHE national study on flooding and health

## Objectives:

- To quantify impact of flooding on mental health and wellbeing one year post-flood and then monitoring annually for up to ten years
- To establish a cohort that can be used to support studies on impact of flooding on health



# Summary



- Flooding has substantial health and social impacts
- Wide range of vulnerable groups, may vary according to stage of flood
- Quantification of costs and benefits of hazards and our responses to them is key, for now and in future
- Not easy – development of methods needed to overcome challenges
- Need to think beyond flood events to health impacts of flood risk management

# Increase of exposure of people and economic assets to natural hazards

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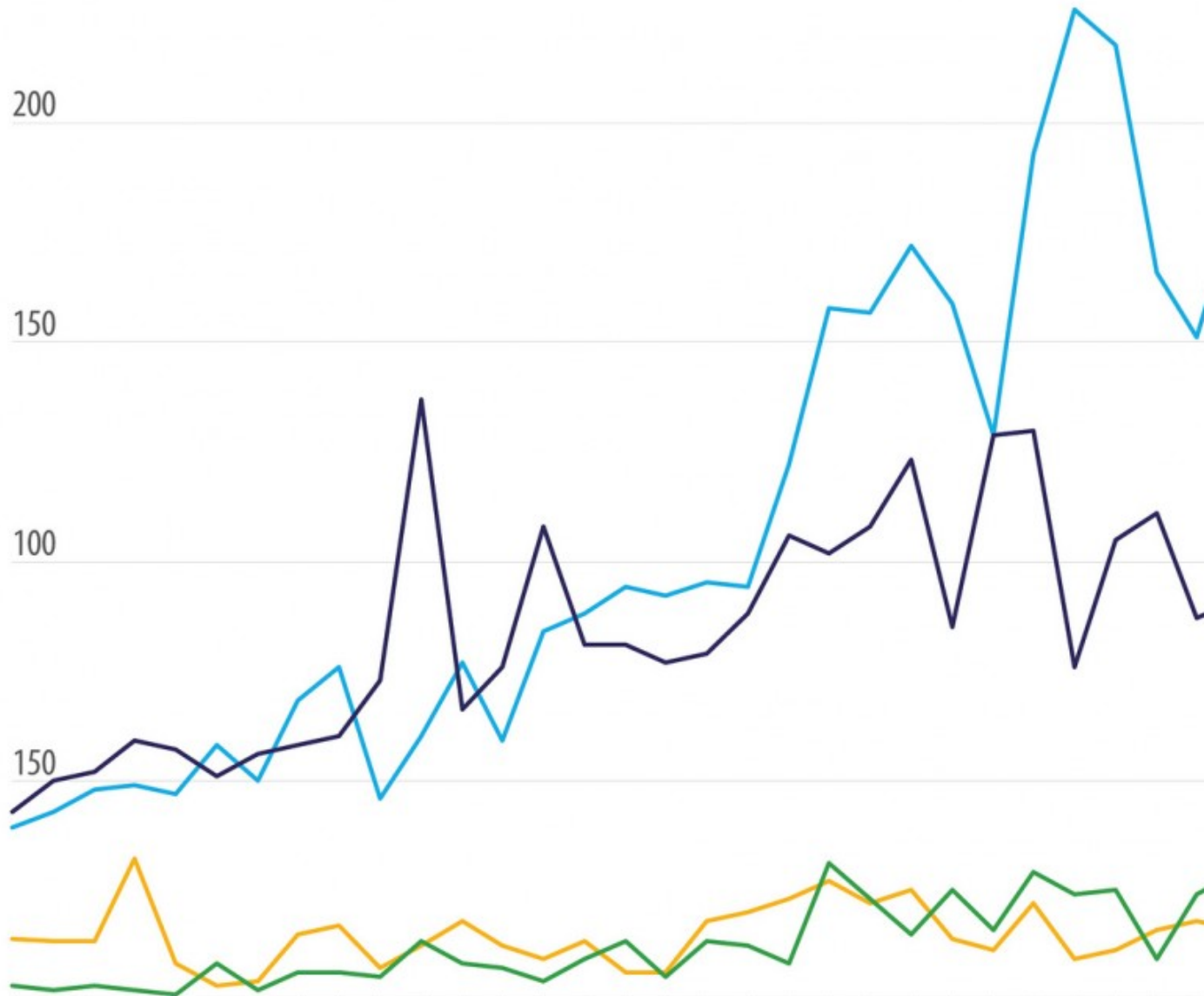
# Number of Climate-related Disasters Around the World (1980-2011)

 **3455**  
FLOODS

 **2689**  
STORMS

 **470**  
DROUGHTS

 **395**  
EXTREME TEMPS



	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>FLOOD</b>	39	43	48	49	47	58	50	68	76	46	60	77	59	84	88	94	92	95	94	122	158	157	172	159	129	193	226	218	166	151		
<b>STORM</b>	43	50	52	59	57	51	56	58	60	73	137	66	76	108	81	81	77	79	88	106	102	108	123	85	129	130	76	105	111	87		
<b>DROUGHT</b>	14	13	13	32	8	3	4	15	17	7	12	18	12	9	13	6	6	18	20	23	27	22	25	14	11	22	9	11	16	18		
<b>EXTREME TEMPERATURE</b>	3	2	3	2	1	8	2	6	6	5	13	8	7	4	9	13	5	13	12	8	31	23	15	25	16	29	24	25	9	24		

 **UNISDR**  
The United Nations Office for Disaster Risk Reduction  
<http://www.unisdr.org>

Created on 13 June 2012  
DATA SOURCES  
EM-DAT - <http://www.emdat.be/> - The OFDA/CRED International Disaster Database; Data version: 13 June 2012 - v12.07  
Humanitarian Symbol Set (2008): <http://www.unisdr.org/map/guideline.php>

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WG II **Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX)**

Organization and TSU

Assessment Reports

Fifth Assessment Report (AR5)

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Meetings

Publications

Links

Contact

## Climate change

disaster risk, exposure, vulnerability, and resilience  
human systems and ecosystems

## Managing risks from climate extremes at

local level

national level

international level

## Toward a sustainable and resilient future

## Case studies

IPCC WG II • Technical Support Unit  
c/o Carnegie Institution for Science  
280 Panama Street



The Nobel Foundation

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IPCC

Phone: +41-22-730-8208/84

Phone: +41-22-730-8208 /84/54

Email: IPCC-Sec@wmo.int



# The IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation

# A changing climate leads to changes in extreme weather and climate events



# Impacts from weather and climate events depend on:



*nature and severity of event*



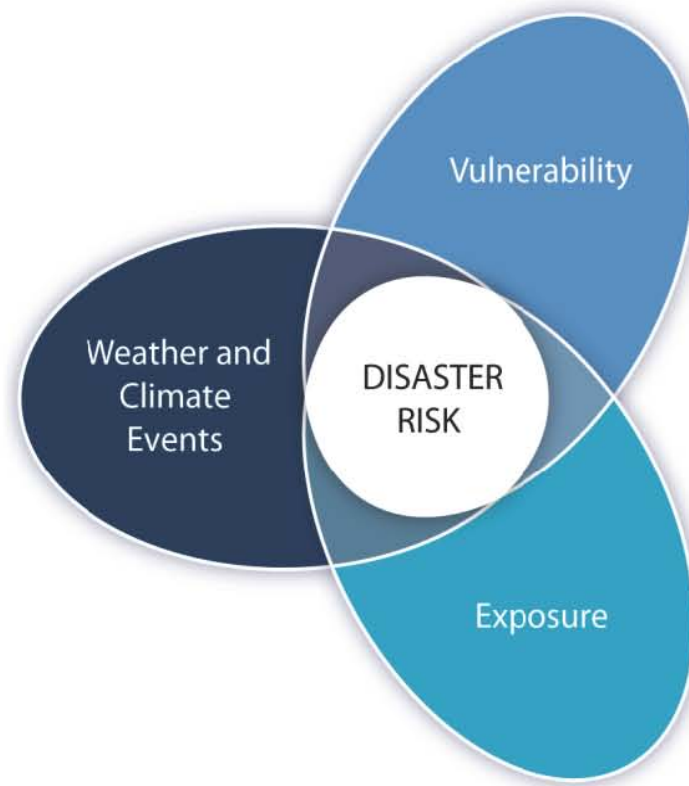
*vulnerability*



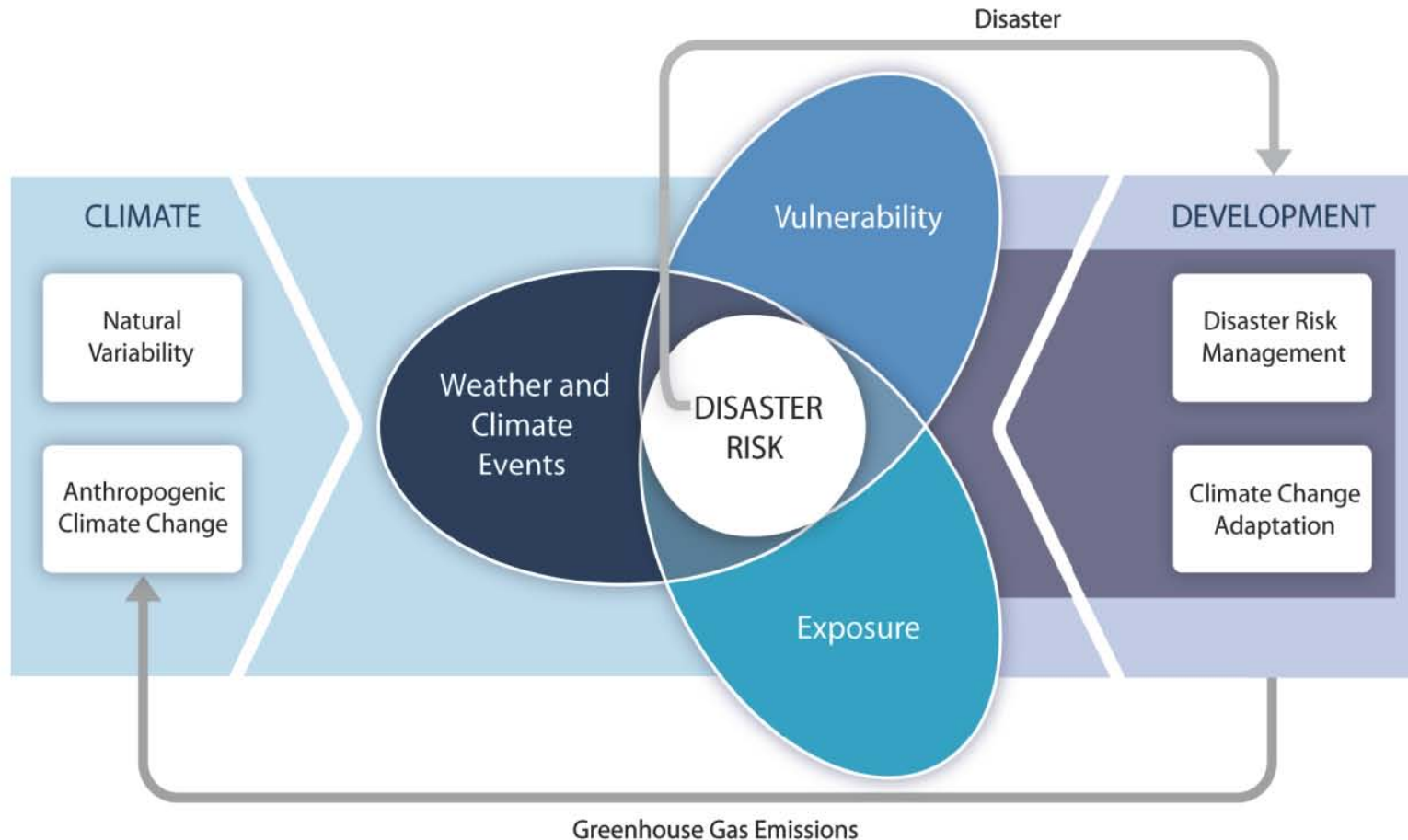
*exposure*



Socioeconomic development interacts with natural climate variations and human-caused climate change to influence disaster risk



Increasing vulnerability, exposure, or severity and frequency of climate events increases **disaster risk**



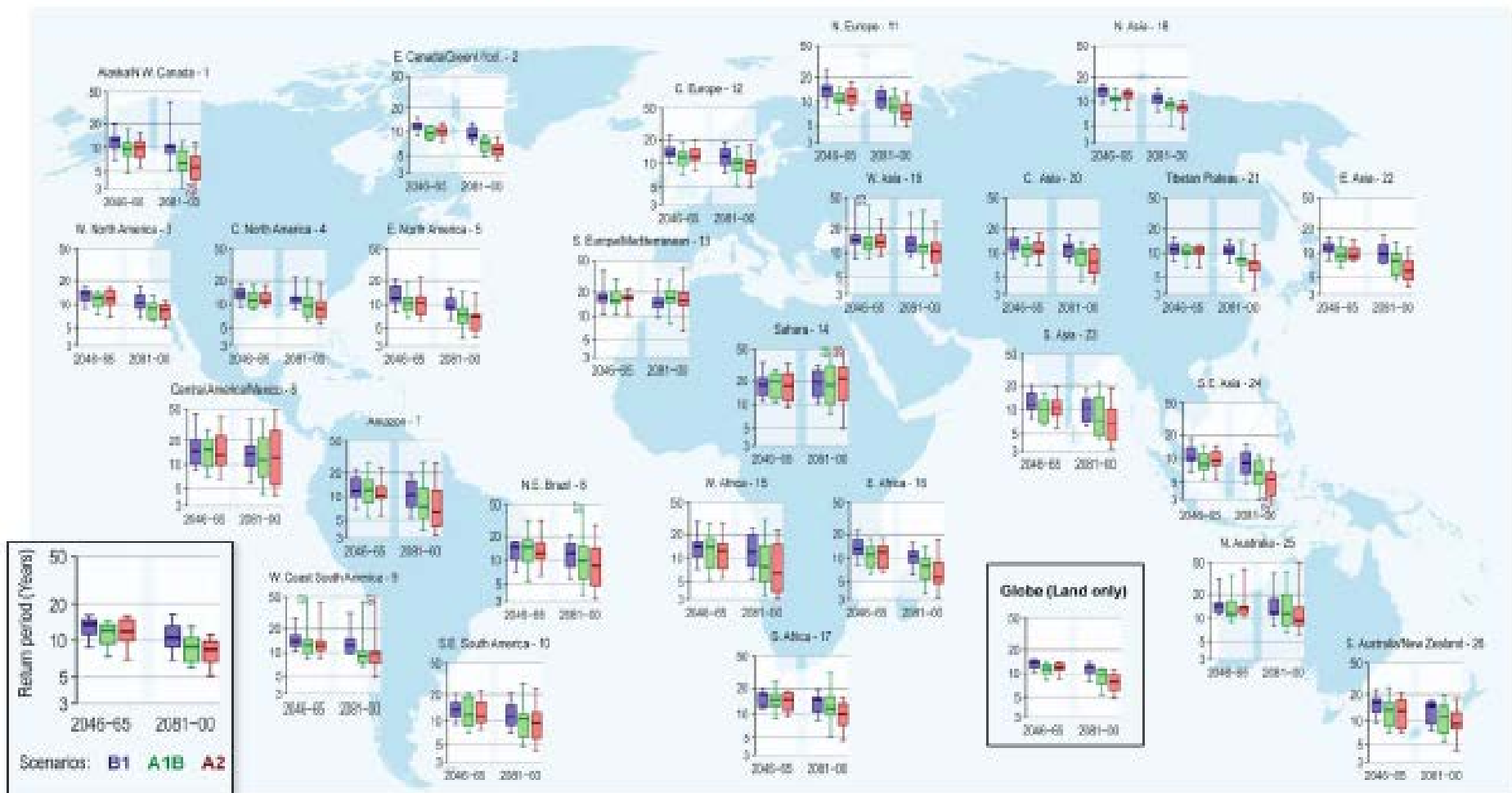
*Disaster risk management and climate change adaptation can influence the degree to which **extreme events translate into impacts and disasters***

Increasing exposure of people and assets has been the major cause of changes in disaster losses



**Pakistan floods, 2010**  
**6 million left homeless**

# Climate models project there will be more heavy rain events throughout the 21<sup>st</sup> century



*In many regions, the time between “20-year” (unusually intense) rainstorms will decrease*

# Managing the risks: flash floods in Nairobi, Kenya

## Risk Factors

- rapid growth of informal settlements
- weak building construction
- settlements built near rivers and blocked drainage areas



## Risk Management/ Adaptation

- reduce poverty
- strengthen buildings
- improve drainage and sewage
- early warning systems

Projected: *likely* increase in heavy precipitation in East Africa



# IPCC Fifth Assessment Report Synthesis Report

IPCC AR5 Synthesis Report

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# CLIMATE CHANGE

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## REDUCING AND MANAGING RISKS

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# ADAPTATION IS

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# ALREADY OCCURRING





**ADAPTATION IS  
ALREADY OCCURING**

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# VULNERABILITY AND EXPOSURE

## AROUND THE WORLD

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# Sendai Framework for Disaster Risk Reduction and global and public health

- Disasters are increasing in frequency
  - International Health Regulations
  - Resilient health systems, health workers and training, disaster medicine
  - Chronic diseases
  - Post disaster psychosocial impacts
  - Safe hospitals
- Pragmatic evidence based science and implementation is key to public health preparedness and response





# Sendai Framework for Disaster Risk Reduction 2015 - 2030

