



National study of the health impacts of the Winter 2013 floods in England

Dr Sari Kovats

Director, Health Protection Research Unit (HPRU)
Environmental Change and Health
LWEC Health Fellow

Outline

- Background
 - How does flooding effect health
 - What do we know about the UK? (previous studies)
- “National Study”
 - Objectives
 - Methods
 - Research governance

	Pre-onset phase	Onset-phase	Post-onset phase
Direct	Injuries	Death (drowning) Injuries (e.g. cuts, abrasions, sprains, fractures, punctures, electrocution) Ischaemic events	Diarrhoeal disease Vector- and rodent-borne disease (e.g. malaria, leptospirosis) Respiratory infections Skin/ eye infections Mental health Injuries
Indirect	-	Health outcomes associated with: <ul style="list-style-type: none"> • Damage to health care infrastructure • Reduced access to essential drugs • Chemical contamination of food and water stocks • Damage to water and sanitation infrastructure • Damage to crops and/or disruption of food supplies • Damage to property - Mould. • Relocation – temporary or permanent • Carbon monoxide poisoning 	

Health and wellbeing outcomes

Health

Cause

- Infectious disease
- Non-communicable diseases
- Mental health
 - Psychological distress
 - Anxiety
 - Depression
 - Post-traumatic stress disorder (PTSD)

Measured

- Self-reported disease
- Routine health data
 - Deaths
 - Hospital admission/
 - GP visit
 - Syndromic surveillance (available in real time).

Wellbeing

- Quality of life (QUALYS)
- Activities of daily living
- Self-reported measures
 - E.G. *Warwick-Edinburgh Mental Well-being Scale (SWEMWBS)*.

2007 floods

% respondents 3-6 months after flooding

- High levels of distress = 69%
- Anxiety = 48%
- Depression = 43%
- post traumatic stress disorder (PSTD) = 22%

Paranjothy S, Gallacher J, Amlôt R, Rubin GJ, Page L, Baxter T, et al.:
Psychosocial impact of the summer 2007 floods in England. *BMC
Public Health* 2011, **11**.

National Study: Partners



Public Health
England

- Dr Isobel Oliver, Field Epidemiology Service, Public Health England (co-PI)
- Dr James Rubin, Kings College London and HPRU on Emergency Preparedness (co-PI)
- Dr Sari Kovats, Prof Ben Armstrong, London School of Hygiene and Medicine, HPRU on environmental change and health.
- Dr Giovanni Leonardi, Environmental Epidemiology, Public Health England
- Dr Angie Bone, Extreme Events, Public Health England
- Dr Richard Amlot, Emergency Preparedness, Public Health England.

Objectives

- To describe the prevalence of psychological morbidity and wellbeing in individuals exposed to flooding compared to those not exposed,
- To identify socio-demographic and environmental characteristics significantly associated with risk of adverse mental health effects,
- To explore if inequalities exist in the recovery from the impact of flooding on mental health and wellbeing.
- To determine self reported help-seeking behaviour among those with psychological morbidity



Open cohort

- To establish an open cohort that can be used to quantify the health impact from flooding
- Add-on studies
 - the long term effects on flooding on mental health, mortality, and health service use using record linkage of individuals
 - validation of GIS techniques using data provided by the Environment Agency and local authorities on exposure to flooding with data from affected individuals

Measuring mental health and wellbeing

- Anxiety and Depression
 - *PHQ-4. (Kroenke et al. 2007)*
- Functional impairment
- Somatic symptoms
- Wellbeing
- Alcohol use.
- PTSD
 - *PCL – S (Lang et al. 2005)*



Definition of exposed population

- The main exposure of interest is “flooded home”
 - standard measures as “presence of flood water in a room used for at least 3 months per year”.
- Second exposure group
 - Those effected by floods but not flooded.
- Other factors that could be examined
 - type of flood (pluvial, riverine, flash floods, coastal/storm surge)
 - warning/lack of warning [sudden onset]
 - magnitude of flood [extent, duration, damage to property /home
 - displacement from home (duration).

Social disruption

- **Disruption of utilities**
 - Water, power, etc
- **Access to work or shops /services by car or public transport**
- **Access to health and social care**



Time course of impacts

Social

- School days lost
- Time spent dealing with claims
- Consequences of moving house/relocation
- Isolation

Health

- Depression/anxiety
- PTSD
- Somatic symptoms
- Access to health care

Economic

- Work days lost/livelihoods/capacity to work
- Possessions lost and replacements
- Building costs
- Critical delays

Social research

- No routine surveys.
- No repeat surveys of the same population.
- Ad hoc surveys done by EA.



Long-term follow up



Population displacement

	National data		Hull
	ABI ^a	Pitt ^b	HCC ^c
Flooded households	65,000	48,000	8,790
Displaced households	17,000 (25%)	14,500 (30%)	5,153 (59%)
Displaced 10 months after flood	1,953 (3%)	4,750 (10%)	2,043 (23%)

^a Estimates by Association of British Insurers ([Chatterton et al., 2010](#))

^b Estimates by The Pitt Review ([Pitt, 2008](#))

^c Follow-up data assembled by Hull County Council

Current flood population surveys

	PHE/Kings	Exeter/HPRU	Kings/HPRU
PIs and key personnel	Isobel Oliver, PHE James Rubin Angie Bone Sari Kovats	Catherine Butler, Neil Adger, University of Exeter.	James Rubin Sunny Patel (PHD)
Funded by	n/a	HPRU and ESRC Urgency Fund –	?
Key questions	Mental health effects of flooding	Determinants of community resilience to flooding	Determinants of individual resilience and adverse mental health outcomes
Face to face - interviews	None [Postal /online]	500	50
Survey population.	6000 approx.	500	50

Research governance

- Ethical approval
- Local engagement
 - Local DPH (Director of Public Health) facilitate access to flooded populations
 - Community – FLAGs
- Coordination
 - Need to avoid over burdening participants
 - Confusion

Next steps

- LWEC (Living with Environmental Change) trying to engage research funds to support study on
 - The full health, social and economic costs of flooding