MICRODIS: Integrated Health, Social and Economic Impacts of Extreme Events: Evidence, Methods and Tools

UK Survey Report
MORPETH

Photo source: Alan Purdue

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January 2010

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1. Introduction

Flooding has become a major concern in the UK, particularly since the widespread summer floods of 2007, which flooded 55,000 properties and caused billions of pounds of damage; 13 people lost their lives and around 7,000 people had to be rescued (Pitt, 2008).

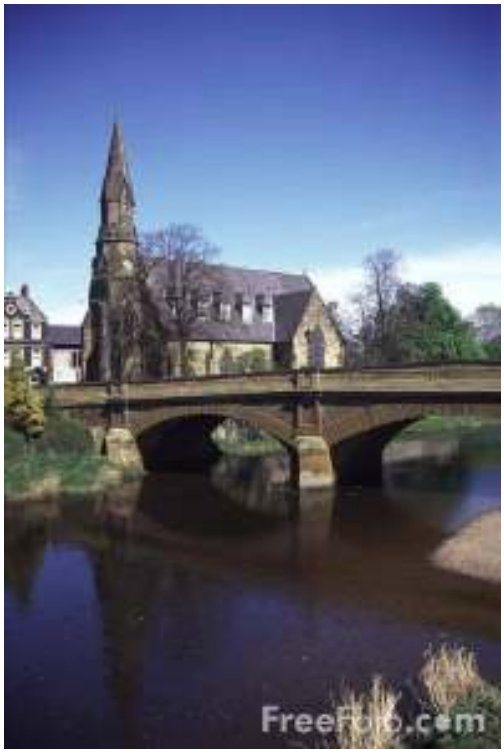
The Environment Agency's 2008 National Flood Risk Assessment shows there are currently 2.4 million properties at risk from fluvial and coastal flooding in England. A preliminary assessment of surface water flood risk suggests that one million of these properties are also susceptible to surface water flooding with a further 2.8 million properties susceptible to surface water flooding alone. Overall, around 5.2 million properties in England, or one in six properties, are at risk of flooding. The expected annual damages to residential and non-residential properties in England at risk of flooding from rivers and the sea is estimated at more than £1 billion. It is likely that with climate change (which could lead to increased rainfall, river flows, and higher coastal storm surges) and development pressures, flood risk in England is going to increase in the future. Without action to reduce flood risk, 350,000 more properties would be at significant risk of flooding by 2035. (Environment Agency, 2009)

This report summarises the background, methodology and activities of the MICRODIS survey in Morpeth, UK, that has been conducted to record the social, health and economic impacts of the September 2008 flood in Morpeth on individuals, households and the community. Particular challenges to and achievements of survey implementation are outlined and some preliminary results described.

2. Background to the Field Site

2.1 Geography

Morpeth is an ancient market town situated in a loop of the river Wansbeck in the northeast of England (see Fig 2.1) about 15 miles north of Newcastle upon Tyne and 12 miles west from the North Sea. Morpeth is located in the county of Northumberland and is the administrative centre for the County Council. The physical form of the town with its existing street patterns was established in mediaeval times.



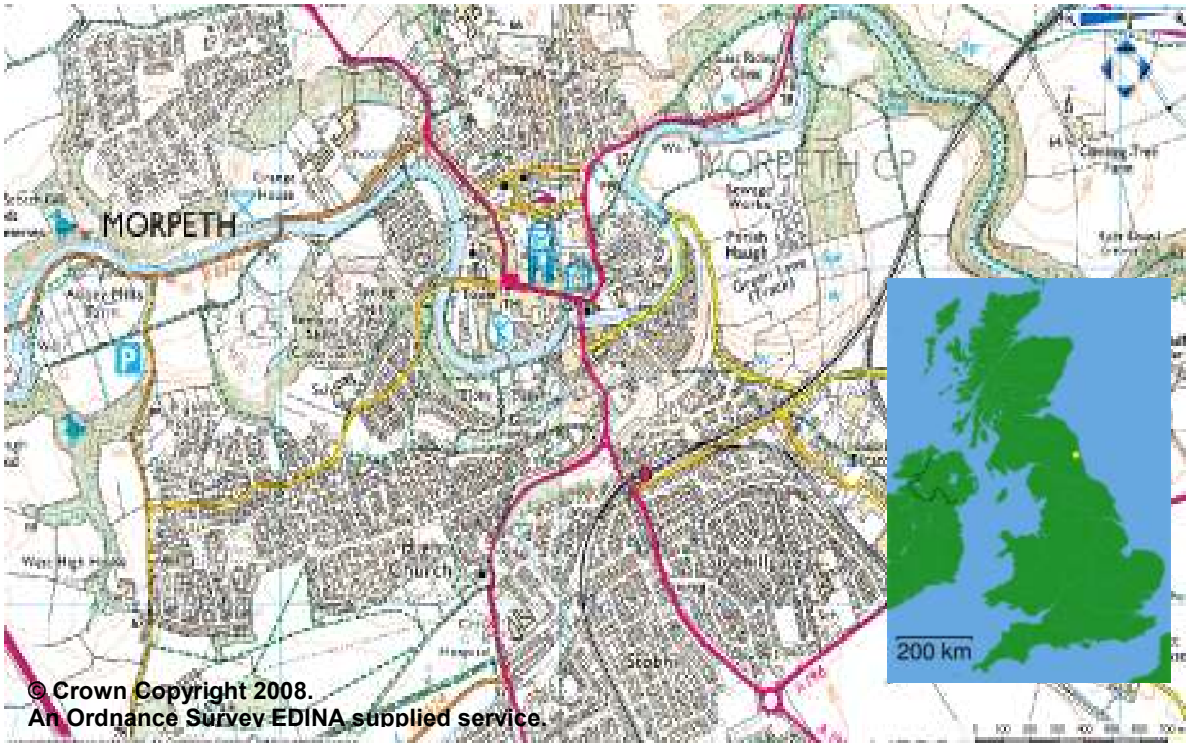


Figure 2.1: Morpeth, Northumberland and its location in the UK Source: Edina Digimap

Morpeth lies in the Wansbeck catchment area, a relatively small river catchment that covers 331km^2. The main reach of the Wansbeck has an active flood plain that is between 100m to 300m wide and the town itself is located within this floodplain. (EA, 2005)

The Wansbeck river has three main tributaries: the Font, which drains the Simonside Hills and contains a locally important water supply reservoir (Fontburn); the Hart Burn, a catchment of similar dimensions but shallower in gradient; and the Wansbeck itself. The three rivers combine before flowing through the town of Morpeth. In Morpeth itself, the Wansbeck is joined by several small tributaries, namely, Cotting Burn, Church Burn and Postern Burn, all with catchments of less than 5 km^2.

The topography of the catchment is decreasing from the hills in the west to the low-lying areas in the east but is overall relatively low with a maximum altitude of 345m AOD (Above Ordnance Datum: height relative to the average sea level at Newlyn, Cornwall UK).

The underlying geology of the catchment is typical of catchments in the area with carboniferous limestone to the west, millstone grit in the centre and Westphalian coal measures to the east (including underneath Morpeth town). Drift geology around Morpeth is characterised by glacial sand and gravel to the north of the town and solid rock to the south. Most of the catchment drift geology (88%) is composed of glacial till. The dominant soil types are slowly permeable and clayey (surface water gley) and, as such, poorly drained and seasonally waterlogged causing rapid runoff in winter. As the underlying geology is largely impermeable, flood response in the catchment is mainly influenced by surface and soil water processes. (EA, 2005)

Land cover in the catchment is dominated by a largely agricultural landscape with woodland, managed grassland and arable land. Major urban and industrial developments (including Morpeth) are situated in the east of the catchment.

The area around Morpeth receives 740mm of standard annual average rainfall, which, however, is given to large annual and seasonal variations.

2.2 Population

The County of Northumberland has a population of around 310,000, 49,000 of which live in the Morpeth district. 13,800 people (7,205 females, 6,628 males) live in the town of Morpeth itself distributed over 6,304 households.

The population density in the town is 19.8 persons/hectare as compared to the low density of 0.61 persons/ha in Northumberland, which reflects the rural character of the county.

The majority of people (67.7%) live in one- and two-person households. Overall 35% of households in Morpeth have children and 20% of households are lone-parent households.

4,850 (80%) of the dwellings in Morpeth are privately owned, while 993 (17%) are rented properties. 89% of people live in an unshared house or bungalow, while the remainder (11%) live in flats or apartments. There are no people living in shared dwellings or temporary structures (e.g. caravans) in Morpeth.

The mean age in the town of Morpeth is 43.6 years. The age distribution of the population of Castle Morpeth Borough is illustrated in Figure 2.2.

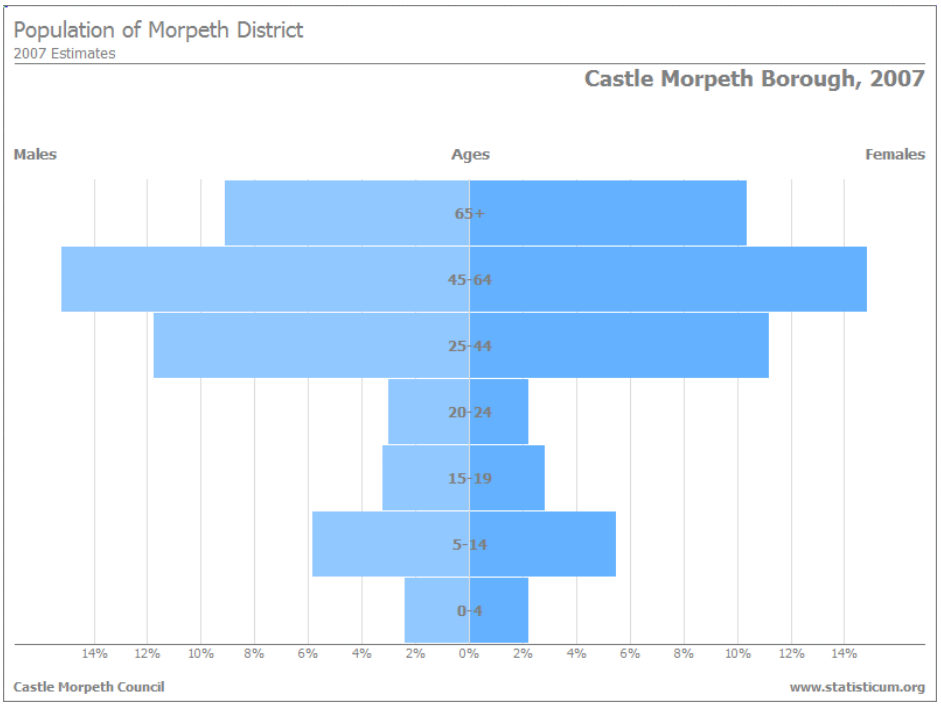


Figure 2.2: Age Distribution by Sex for Castle Morpeth Borough
(based on Castle Morpeth Borough Council data, 2007)

Figure 2.2 illustrates the increasingly ageing population of Morpeth with a large proportion of people living on pensions (65+ age range). The gender imbalance in the older population reflects the higher life expectancy of females.

Ethnically, Morpeth town has a predominantly white population (99%).

Table 2.1 summarises the religious affiliations of the Morpeth population, with the majority (82%) being of Christian faith.

Table 2.1: Religious Composition of Morpeth Population

	Christian	*Buddhist*	*Hindu*	*Jewish*	*Muslim*	*Sikh*	*Other*	*No religion*	*Not stated*
Persons	11280	12	12	6	61	0	33	1621	805
%	81.6	0.09	0.09	0.04	0.44	0	0.2	11.7	5.8

Note: Percentage figures may not add up to 100 due to rounding.
Source: 2001 census

There are 12 schools, both primary and secondary, located directly in the town of Morpeth, including one special needs college for all ages. There are also a number of nurseries and pre-schools in the town. Educational achievements, i.e. quality of schools, are good in the district and considerably higher than in the northeast of England or England as a whole (Castle Morpeth Borough Council, 2007).

There are five doctors' surgeries and one small NHS[1]-run 83-bed community hospital in Morpeth.

Of the inhabitants of Morpeth in 2001 9,255 (66.9%) reported to be in good and 3,209 (23.2%) to be in fairly good health; 1,299 (9.4%) people described their health as not good, and 2,907 people (21%) reported that they suffered from a long-term limiting illness. This is slightly better than the 2001 Census reports for the northeast region and similar to the English average. Premature deaths of people under 75 years in Castle Morpeth Borough from circulatory disease and cancer are lower than the regional and English average.

Life expectancy in Castle Morpeth Borough was 78.2 years for males and 80.9 years for females born between 2003 and 2005, which is slightly higher than the English average for the same period for males (76.9 years) but lower for females (81.1 years); it is higher than the northeast average for both males and females (75.4 and 79.8 respectively).

2.3 Economy

The regional average gross disposable household income per person for the counties of Northumberland and Tyne & Wear in 2007 was 12,413 GBP, well below the national average of 14,317 (Office for National Statistics, 2009). Morpeth is one of the wealthier towns in the northeast of England.

Morpeth and the surrounding area are popular with tourists (mainly 'day trippers') due to its being attractive for outdoor pursuits like walking, angling, etc. Morpeth town itself is appealing but does not offer many potential leisure activities. "The Council

[1] National Health Service

does not have a clear vision on tourism and how this contributes to improving the economic vitality of the area "(Audit Commission, 2006).

72% of the Morpeth population are aged between 16 and 74 years. 45% of the Morpeth inhabitants in 2001 were economically active, 2.8% of which were unemployed. 27% of Morpeth inhabitants are economically inactive, 54% of which are pensioners. Industries of employment are presented in Table 2.2.

Table 2.2: Industry of employment

	Number of persons	Percentage of employed population
Agriculture, hunting and forestry	52	0.9
Mining & Quarrying	31	0.5
Manufacturing	616	10.5
Electricity, gas and water supply	57	1
Construction	352	6
Wholesale and retail trade, repairs	688	11.7
Hotels and restaurants	275	4.7
Transport, storage and communications	299	5.1
Financial intermediation	181	3.1
Real estate, renting and business activities	705	12
Public administration, defence, social security	610	10.4
Education	779	13.2
Health and social work	983	16.7
Other	260	4.4

Note: Percentage figures may not add up to 100 due to rounding.
Source: 2001 census

91% of the working population work within a 20km radius of Morpeth. About half of these travel 5-30 km to their place of work, implying that Morpeth itself has limited employment opportunities and many people commute to the more industrialised centres of Ashington, Blyth and Newcastle upon Tyne. 24% of households do not own a car, reflecting the large proportion of pensioner households in Morpeth.

2.4 Disaster context

2.4.1 Disaster history

Flooding is the only major disaster risk in the Wansbeck catchment area and Morpeth is the main flood risk area within the catchment. Flooding has been a regular occurrence in Morpeth since the town was first built because of its location and the topographic and soil characteristics described above.

The main sources of flooding in the Wansbeck catchment have been identified as extremes in rainfall and snowmelt (on average 56% of precipitation is converted to surface runoff), with minor contributions from impenetrable (paved) surfaces and ageing municipal drainage networks in the town itself (EA, 2005; JBA, 2008). Furthermore, there are 1,139 properties located directly on the floodplain (EA, 2005).

Most floods in Morpeth occur in winter when the ground is already saturated and runoff increased but summer floods can occur due to localised summer storm events directly over the catchments of the smaller tributaries, which can cause localised flooding independent of the river levels of the Wansbeck (EA, 2005). The catchment response time (time lapse between mid-point of storm rainfall and peak in river level) at Morpeth is eight hours.

Reliable historical data for flooding is available since 1839 and 18 flood events have been recorded. Morpeth experienced its previously largest memorable flood event due to an unexpectedly rapid snowmelt in March 1963 when 503 properties (482 residential) were flooded. The return period of this event was estimated at 60 years.

Flood defences were built after 1963 to cope with river levels experienced in that particular flood (Fig 2.3) but defences could not be built in some parts of the town because of local opposition. Flood defences consist of walls and banks of varying heights (from 0.2-2.0m), which are inspected every six months and were found to be in good to very good condition prior to the 2008 flood.

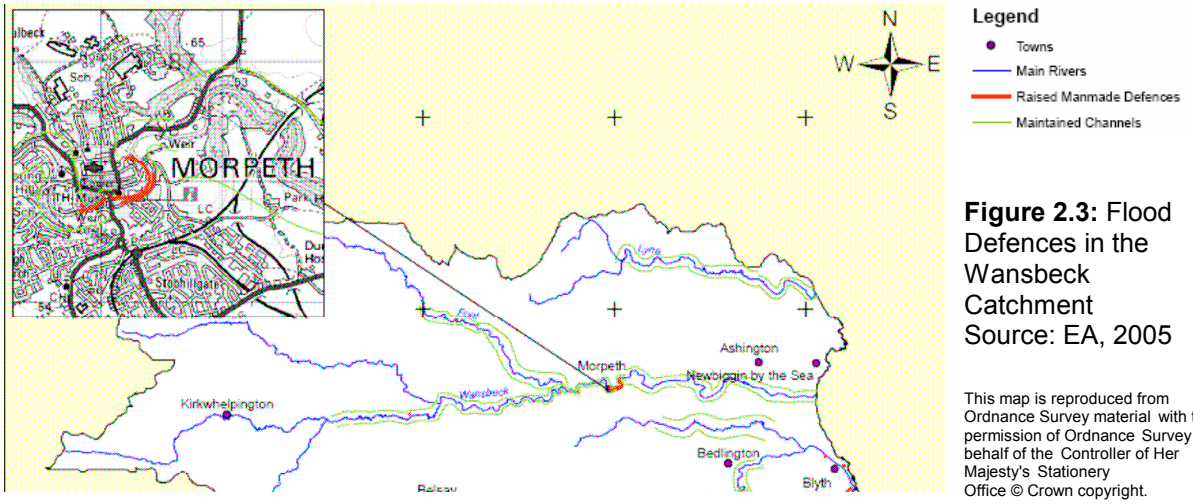


Figure 2.3: Flood Defences in the Wansbeck Catchment
Source: EA, 2005

Modelled flood risk of a 100-year event at Morpeth shows the likely broad extent of potential flooding events (Fig. 2.4).

Flooding from rivers without defences

Extent of extreme flood

Flood defences

Areas benefiting from flood defences

Figure 2.4: Modelled Potential Flood Extent of a 100-year Event in Morpeth

Source: http://www.environment-agency.gov.uk

A flood-warning-scheme implemented by the Environment Agency is in operation and a Flood Warning Plan has been published by the Environment Agency that lays out in detail the flood warning codes and procedures (EA, 2005).

Castle Morpeth Borough Council also implemented a number of awareness raising activities in collaboration with Northumberland County Council, the Environment Agency, Northumberland Fire & Rescue Service and Northumbria Police prior to the flood event to alert the population that a flood could happen and to introduce emergency plans. The multi-agency Emergency Plan and Flood Action Plan are publicly available. A Recovery and Restoration Guidance Document has also been available since July 2007.

Two multi-agency flood exercises were carried out (October 2001 and October 2003) to prepare responders, familiarise them with emergency procedures and improve agency coordination.

An analysis of public awareness carried out after the 2008 flood event found that residents had been aware that a flood could happen but were not prepared for its severity; and only a minority of residents had made personal preparations to protect their property and themselves in case of emergency. Most people were also not aware of the Flood Action Plan.

Since the 2008 flood a new flood action plan has been prepared by the Morpeth Flood Group with contributions from the Environment Agency, Northumberland County Council, Northumberland Fire and Rescue, Northumbria Police and Castle Morpeth Borough Council, and offered for consultation, i.e. comments from the community and other interested parties.

The Environment Agency introduces the new Morpeth flood alleviation scheme options to Morpeth residents

The Environment Agency have prepared a flood alleviation scheme for the town of Morpeth, which includes repairing existing defences damaged by the flood but also incorporates several new options for measures for flood defence. This new scheme is currently being discussed and feedback from residents has been invited.

2.4.2 The September 2008 flood

Morpeth experienced a severe flood on 6 and 7 September 2008, when river levels exceeded the ones of the 1963 flood. The flood is currently estimated to have been a 1 in 115 year event.

The flood was caused by heavy slow-moving storms, which gave the area one month's rainfall (up to 140mm = 200-300% of average September rainfall) in just 24 hours on a catchment already saturated due to greater than average rainfall during July and August (JBA, 2008).

Furthermore, prolonged rainfall over Morpeth coincided with the arrival of the flood peak from the higher areas of the catchment, which had received prolonged

overnight rainfall. Structural failure of Highford Weir upstream of Morpeth likely further increased the volume of water flowing downstream (JBA, 2008).

The Wansbeck River rose well above its banks and overtopped and damaged the town's flood defences. A peak water level of 3.99 metres was recorded in the river channel, the biggest flow ever recorded in the Wansbeck. The huge volume of water also caused the drainage system to back up contributing to the flooding of the town, while the substantial structure of Oldgate Bridge obstructed the flow of the flood waters in the river channel and exacerbated flooding of the town (JBA, 2008).

At the peak of the flood, Morpeth's main road (Bridge Street) was under 0.6m (2ft) of water. Not since 1963 had the main street flooded.

Morpeth on 6 and 7 September 2008 – Impressions of the flood (Photos: Alex Bennett)

An error made by the Environment Agency warning system meant that 200 people did not receive flood warnings, although the Environment Agency issued 22 Flood Warnings and seven Severe Flood Warnings and successfully reached over 500 properties on 5 and 6 September. On average residents reported a duration of between one and three hours between receiving the first flood warning and water entering their homes.

During 6 September 2008, more than 400 residents were evacuated. However, delays in initiating evacuation after the first warning had been received and the speed of the onset of flooding meant that many evacuation routes had already flooded hampering the speed of evacuation and increasing the risk of injury and death for residents and rescue personnel. Fire-fighters, ambulance crews, the RAF (Royal Air Force), Mountain Search and Rescue teams and the RNLI (Royal National Lifeboats Institution) were among the emergency services involved in rescue and recovery

operations over the weekend. The voluntary sector, e.g. the British Red Cross, were also heavily involved in rescue and recovery operations.

Rescue operations during the Morpeth flood on 6 September 2008 (Photos: Alex Bennett)

Shelter was provided in the Town Hall, King Edward VI High School and County Hall. Due to the flood happening over the weekend, Abbeyfields First School (which is identified as a rest centre in the Flood Action Plan) could not be set up as the contact person and key holder could not be reached.

Overall the flood caused direct damage to 1,012 properties, including 913 residential properties of which 615 were 'severely affected'[2]. Many people were displaced and the economic damages are probably the greatest ever experienced in Morpeth (JBA, 2008).

The aftermath of the flood (Photos: Judy Evans)

3. Methodology

A pilot study was conducted in Morpeth, Northumberland, on 25 and 26 November 2008, and the first UK site survey was carried out in Tewkesbury between 4 and 23 January 2009[3].

[2] Defined by Castle Morpeth Borough Council as "those properties where floodwater has entered the habitable area of property"

[3] For descriptions of these surveys please see Morpeth Pilot Study Report and Tewkesbury Survey Report.

Both studies were valuable as standalone studies but also contributed much to the Morpeth survey design in terms of practical experience and a better understanding of flood impacts in the UK context. The lessons learned during these surveys are reflected in the methodology and approach to the Morpeth survey.

3.1 The quantitative survey

3.1.1 Sampling

Due to the fact that flood disaster in the UK generally affect a relatively small number of households – in comparison to disasters in a developing-world context – it was decided to use a census approach to sampling for the Morpeth survey. As the non-response rate for quantitative surveys in the UK context is relatively high it seemed logical to approach all affected households.

Moreover, a list of addresses of affected households in Morpeth could be obtained, which avoided the need for geographical sampling. However, during the Morpeth survey it transpired that this address list was not complete, so further adjustments and additions had to be made to the list while the survey was underway.

The Morpeth study did not include an independent control group survey. Instead it was decided to categorise flood-affected survey respondents according to the severity of flooding of their homes during data analysis to account for differential impacts due to 'level of affectedness' of households.

3.1.2 Questionnaire adaptation

Questionnaire adaptations had already been made for the Tewkesbury survey based on the experiences in the pilot study in Morpeth[4]. Based on the practical experience of the Tewkesbury survey and data analysis, further adaptations to the questionnaire were made.

The detailed adaptations to particular questions have been described in the deliverable report D4.4.2 'Final Assessment Protocols and Lessons Learned'. Thus, this section will only give a general overview of the additional adaptations of the assessment protocol for the Morpeth survey.

The Morpeth survey applied a particular focus to socio-psychological factors and mental health impacts of floods, which had been identified as important in the UK context through Tewkesbury survey data analysis. Thus, data collection tools for an integrated mental health study were developed in collaboration with the MICRODIS partner HealthNet TPO, the Netherlands.

In addition to this mental health study, the theme of social capital was extended to better capture the characteristics of the community (e.g. social and political participation, neighbourhood problems, collective efficacy, social networks, etc.) and the importance of social relationships in mediating impacts of flooding on individuals, households and communities, as well as to determine the impact that disasters, specifically flooding in the UK, have on those social relations.

[4] see Tewkesbury Survey Report and D4.4.2 'Final Assessment Protocols and Lessons Learned' for details

However, despite this more specialised study focus, all MICRODIS core questions were detained, as far as possible, to ensure comparability of survey data from the UK with other country survey data.

Besides the adaptations relating to these two themes of focus, the questionnaire required a detailed review of the economics section. The economic core section was thus completely revised with expert help and input from the Economic Working Group. This became necessary as the original economic questions were very focused on developing country contexts and many of the questions were not applicable to the European/UK context or would have had to be adapted to a disproportionate extent.

Some general observations on further adaptations as well as some observations pertaining to quantitative surveys related to disasters in the UK context are given below.

- It is important to consider the length of time that has elapsed since the disaster occurred. If the time is too short (like in the Morpeth pilot survey) many of the questions do not (yet) apply, e.g. damages have not been fully taken into account; people are still displaced so cannot answer questions on cost of displacement, length of stay, etc. Displaced people are furthermore often inaccessible in the UK context, as it is not possible to obtain their temporary addresses due to data protection. If the time since the disaster is too long, gaps in data occur (particularly in detailed economic questions) as respondents cannot recall the required information.
- As the questionnaire is meant to be a generic tool it does not refer to the disaster in question. It is, however, appreciated by respondents if specific references are made to their personal experience with 'their disaster', and it can also be valuable to collect disaster-specific information (for instance on particular government schemes or documents related to the disaster, e.g. flood action plans for specific locations in the UK). This should be kept in mind in adapting the questionnaire tool to the local context.
- 'Head of Household' was found to be an awkward concept to use in the UK context. Many respondents were unsure whom they should state as the head of household and many said 'we are joint heads of the household'. To make the question easier to understand for respondents this term was changed to 'respondent' for Morpeth.
- 'Date of Birth' information is considered personal information in the UK. Therefore it was necessary to offer to respondents to give only their age or an age range if they did not want to disclose their actual date of birth.
- Many respondents were uncomfortable giving detailed economic information (particularly on income). The Morpeth questionnaire offers respondents the possibility to give an income range for total annual household income if they are not willing to disclose more detailed figures to make it at least possible to quantify the approximate socio-economic status of households.
- The role of insurance in recovery was emphasised by many respondents (both in a positive and negative way) in Tewkesbury. The Morpeth survey includes a set of questions on insurance issues, which were developed in collaboration with the Economics Working Group.
- Health questions generally worked well. However, data on access to health care, death and injury are limited because significant direct physical health impacts are unusual occurrences in the European context.

3.1.3 Interviewers

The UK country team decided to contract an independent professional survey and research consultant firm, ECOTEC, to conduct the quantitative survey in Morpeth to free up more of the team's time for in-depth qualitative fieldwork and community engagement.

ECOTEC has all the necessary resources and procedures in place, conducts in-house training of interviewers and can hire interviewers local to the survey area who can devote their time solely to the quantitative survey. A further benefit of out-contracting the quantitative element of the survey is that this also entails that electronic data input is completed by experienced staff and data clean-up and quality control are carried out routinely.

ECOTEC were provided with the training documents prepared by the UK country team (Interviewer Training Manual and 'mental health' training presentation by HealthNet TPO) and the questionnaire tool well in advance of the start of the survey to ensure a thorough understanding of the aims, objectives and procedures of the MICRODIS survey. This was complemented by a meeting and continuous e-mail and telephone contact between the UK country team principal investigator and the ECOTEC project manager.

Interviewers were selected by ECOTEC's area fieldwork supervisor based on their skills, experience and availability. Nineteen interviewers from the North East region were selected to work on this project with each allocated between five and 60 interviews to complete.

3.2 Qualitative fieldwork and community engagement

The importance of qualitative fieldwork, including awareness activities and community engagement, should not be underestimated; these are vital activities not only for obtaining qualitative data but also for their potential positive effect on the response rate and the insights researchers can gain that might otherwise not be accessible to them. Community engagement and raising awareness become more difficult with compressed survey periods (due to budgetary constraints) and increasing distance of the survey site. This is the main reason that the UK country team decided to change the second survey site to Morpeth, rather than going with the earlier choice of Sheffield, as access and frequency of contact is greatly improved and good-quality community engagement possible.

This enabled the UK country team to establish closer and more permanent contacts with not just residents but also the authorities and civil society organisations involved in the Morpeth flood response and recovery, which facilitates a much more comprehensive insight into emergency policies and procedures and how these interact with and are perceived by the community. It also gives the researchers the opportunity to better observe interagency communication as well as communication between public and civil agencies and the community.

The following qualitative activities have thus far been carried out in Morpeth:

1) Presence of MICRODIS researchers at and participation in flood-related community meetings with residents and public representatives (local authority, Environment Agency, police, fire and rescue service, water services companies, etc.)
2) Dissemination of information letters and MICRODIS leaflets to all identified flood-affected residents;
3) Meetings, discussions and interviews with representatives of the local flood action group (Morpeth Flood Action Group);
4) Meetings, e-mail contact and discussions with representatives of the Environment Agency and local authority;
5) Interviews with mental health professionals;

An Environment Agency representative explains the 'Morpeth Flood Warden Scheme' to members of the MICRODIS UK country team

6) Interviews with the Operations Director of the British Red Cross (the BRC actively participated in and also coordinated the voluntary sector contribution to restoration and recovery);
7) Dissemination of project leaflets to non-affected residents and other people and organisations met;
8) Interviews with flood-affected residents (28 to date) to attain in-depth information on various subjects (displacement, mental health impacts, insurance issues), but also to raise awareness about the subjects discussed among participants and motivate further discussion within their immediate social environment, and thus contributing to raising social and disaster awareness and preparedness within the community.
9) Participatory neighbourhood/community mapping.

Participatory community mapping at a 'Flood Awareness Event' in Morpeth Town Hall

Some of the qualitative fieldwork outlined above was conducted in the form of self-contained annex studies to the MICRODIS project. The following studies have been carried out so far:

1. A study investigating the health and social impacts of displacement on flood-affected Morpeth residents with particular reference to the differences between impacts on people staying with family and people staying in rented accommodation or hotels. The study was carried out by Laura Irvine, MICRODIS Technical Officer from the Centre for Research on the Epidemiology of Disasters (CRED) at the Université catholique de Louvain, Brussels. Laura carried out 10 in-depth interviews from 19 to 25 August 2009 and is currently transcribing and analysing the findings.
2. A study into the mental health impacts of the flood was conducted by Tim Wind from the MICRODIS partner HealthNet TPO, the Netherlands. Tim

carried out interviews with Morpeth residents, health professionals and the British Red Cross Operations Director for the North East and Cumbria from 14 to 18 September 2009. He has summarised his findings and is conducting further analysis at present.

3. Nick Grainger, a postgraduate student from the Masters course in Disaster Management and Sustainable Development at Northumbria University, chose the role of flood insurance in Morpeth as his dissertation subject. He carried out interviews with affected residents and insurance providers and has since completed and submitted his dissertation.
4. Joelle Yap, a postgraduate student from the Masters course in Disaster Management and Sustainable Development at Northumbria University, completed and submitted her dissertation on the subject of 'educating children about disasters: the role of play'. The project was implemented at Morpeth Goosehill Primary School and included a general discussion and quiz, a puppet film on floods, and a learning activity (putting together an 'emergency go-bag') with quiz for the pupils of the school. There was evidence of individual learning and increased disaster risk awareness among the pupils as a result of the study.

Getting children involved – Assembly talk at Goosehill Primary School, Morpeth (Pictures: Joelle Yap)

The following activities are planned for the near future:

1) Further and continued presence at/participation in flood-related community meetings;
2) Article in local newspaper to raise awareness, give further details on the MICRODIS project and motivate residents to take part in upcoming qualitative activities;
3) Dissemination of summarised quantitative survey findings to Morpeth residents at an organised event (open day/drop-in centre) through posters, short reports/leaflets, etc.

Such an event will be held at a central location in the town and give residents an opportunity to inform themselves about the findings of the MICRODIS survey and also to voice concerns and discuss the results with the project team. Moreover, it will contribute further qualitative information to the survey and provide feedback to the project team on how the quantitative survey was received by residents, as well as identifying concerns and issues that may not have been addressed by the questionnaire, which can then be taken up through qualitative methods.

4) Dissemination of summary report to local authority, Environment Agency, local NGOs and others;

It is hoped that the dissemination of results to interested parties will initiate and/or inform discussion between different groups and organisations and contribute to preparedness measures in the future that are more participatory and focused on residents' needs, thus enhancing community resilience. It is also expected to contribute to a positive attitude to researchers generally and aid those coming after us.

5) Further in-depth interviews with flood-affected residents;

6) Focus group discussions with affected residents and other groups;

7) A comprehensive annex study into the role of social capital in the Morpeth flood response and recovery by Manuela Scharf, PhD student and MICRODIS UK researcher;

8) A further annex study by Heather Taylor, a postgraduate student from the Masters course in Disaster Management and Sustainable Development at Northumbria University, on self-help and actual and perceived responsibilities for flood mitigation measures.

4. Challenges and Achievements

The main challenge was non-response: from the address list of 976 households, 236 questionnaires (25%) could be completed. To some extent this was caused by difficulties to gain access to a large proportion of respondents, as some were still displaced and others were often not at home and could not even be reached through repeat calling at various times of the day and on various days of the week. Refusals also played a role. As the flood event happened fairly recently, some people did not want to talk about it in detail as they were still in the recovery process and wanted to put it behind them ('get back to normal'), others thought it might upset them too much to revisit the experience.

At the same time, the completion of 236 questionnaires is, of course, an achievement and will contribute to a better understanding of flood impacts on communities in the UK, and enable the team to quantify the social, health and economic disaster impacts.

The UK team's extensive community engagement has led to considerable interest among residents in the MICRODIS study. Many residents have expressed their interest to participate in qualitative activities. This is a significant achievement as well as a challenge in terms of accommodating and following up this interest.

It has been a very rewarding experience for the UK country team to be able to engage more extensively with the community and the public and civil society agencies involved in response and recovery operations, such as the Environment Agency, the council, the British Red Cross, the Morpeth Flood Action Group, the Morpeth Lions Club, etc. The UK team was able to build good rapport with residents and other groups and this has contributed to a better understanding of the background to the disaster and has enabled the team to observe (and continue to do so) the lengthy recovery period much more closely.

The qualitative results are of great value in identifying concerns and issues important to households and the community. This will help the UK country team to make

detailed recommendations for the questionnaire content and local adaptations to the UK context and compare these to the methodology and findings of other European surveys.

Furthermore, the qualitative fieldwork has been felt to be a valuable opportunity to study the social, health and economic impacts of the flood that had been quantified in the questionnaire tool in more depth and give further validation to the survey findings.

Out-contracting the quantitative survey element meant that there were also more time and resources available to the UK team for facilitating and implementing more structured MICRODIS annex studies in Morpeth (see 3.2).

Worth mentioning is also the value of the MICRODIS study for teaching purposes at Northumbria University, where both project content and methodology have been used as exemplars on the Masters course in Disaster Management and Sustainable Development. This has engendered much interest among students, which resulted in dissertations on the Morpeth flood already having been completed as well as the potential for future dissertations. Students have also been actively participating in project activities of the UK country team, e.g. participation in a flood awareness event in Morpeth Town Hall organised by the Morpeth Flood Action Group, where the UK country team had a stall to promote the MICRODIS project and carry out participatory activities with Morpeth residents.

Preliminary survey results have also been presented at an event organised by the British Red Cross in honour of the efforts in flood response and recovery made by civil society organisations and there was much interest to be kept informed about the findings when more reliable statically verified results became available.

5. Preliminary Field Observations and Results

The dataset is still in the process of being cleaned at present. However, some indicative descriptive results are already available, though slight changes to these findings may occur after cleaning of the data:

- The sample is largely female (62%) - and aged over 65 and retired (60% people living on pensions), a further 28% of respondents are aged between 40 and 64.
- 98% of respondents are British citizens and 98% of the sample are white.
- The dominant religious affiliations of respondents are Protestant (50%) and Catholic (15%), while 19% describe themselves as Christians and 14% state that they have no religion.
- 36% of respondents are married, 33% widowed and 17% are single.
- About 42% of respondents stated they had no school qualifications. Again, this cannot be seen as representative of the general population and may be due to the large proportion of pensioners in the sample who would have attended a very different school system than the younger generations.
- 7% of respondents are unemployed, which is similar to the national average of 7.8% for the same time period[5].
- The majority of respondents live in one or two person households (52% and 33% respectively) – families with children are under-represented.

[5] Office for National Statistics, January 2010

- Most people (65%) own their own homes but a quarter of respondents live in social rather than private properties.
- Two thirds of respondents had lived in Morpeth itself for over 20 years (half for over 30 years).
- A third of respondents had lived in their (flooded) property for over 20 years.
- For 93% of respondents the 2008 flood was their first and only experience of a disaster and 82% rated it as 'very severe'.
- Over 80% of the sample had been displaced due to the flood for varying lengths of time.

On social, heath and economic impacts the following observations can be made to date:

Social

- For many, their friends, family and neighbours were a major source of support and continue to be so.
- The stress of having to leave home and getting the house back to normal was rated as highly as the stress of the event itself.

Health

- Only 5 people (2%) of the sample were physically injured due to the flood.
- Just over a quarter reported someone in their household becoming sick due to the flood but most of these illnesses were stress-related: feeling depressed, feeling anxious, high/unusual stress levels and insomnia.

Economic

- Just over 25% of respondents said their economic situation got worse due to the flood.
- For around 50% of respondents insurance premiums have risen since the event and for around 25% insurance excess has also increased.

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