The Public Health Response to Chemical Incident Emergencies (CIE Toolkit)

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WP8: Risk and crisis communication requirements following a chemical incident or emergency

INTERNAL REPORT FOR THE EC

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1. EXECUTIVE SUMMARY

The work described in this report forms part of a programme of research being conducted by the Health Protection Agency UK, the Swedish Defence Research Agency (FOI), the National Kapodistrian University of Athens (NKUA), the Nofer Institute of Occupational Medicine (NIOM), the Instituut voor Psychotrauma (IVP) and King’s College London (KCL), with the collaborating partner WHO through the IPCS (WHO IPCS). This research programme is entitled The Public Health Response to Chemical Incident Emergencies (CIE Toolkit). This is the final report for Work Package 8: Risk and crisis communication requirements following a chemical incident or emergency, which has been conducted by KCL.

A long-standing but rapidly growing literature indicates that effective public communication forms an essential part of any emergency response programme. However, a number of risk communication barriers around Chemical Incident Emergencies (CIEs) have been identified. For example, hazard information surrounding the likelihood and impact of industrial/environmental disasters can be inward facing and designed to suit the needs of industry. Additionally, organisations often fail to communicate the risks to emergency response organisations, health organisations or local authorities, and, when information is provided, it is not appropriate for communication in a public setting. This report describes the findings of a programme of research designed to determine (1) UK and Polish health responders’ information needs and concerns through the course and aftermath of a chemical incident, as well as their knowledge of existing plans for responding to the event and communicating with members of the public, and (2) UK and Polish public levels of trust and predicted behavioural response to existing emergency response plans and messages.

Three 1-2 hour focus groups were conducted with health responders in the UK (N=12) and four 1-2 hour focus groups were conducted with health responders in Poland (N=14) using a chemical incident scenario to explore their information needs, communication strategies and perceptions regarding public information needs and responses in relation to a chemical incident. The scenario involved the collision between two tankers at a petrol station adjacent to a large shopping centre located in a residential area. The scenario was progressed using a series of injects in the form of a mock newspaper article and incident update cards.

Focus group participants in both countries demonstrated a good awareness of the key players and stakeholders, their roles and responsibilities and established emergency procedures. UK and Polish health responders’ information needs were similar and participants in both countries recognised the importance of good inter-agency communication. There was a shared expectation that members of the public in both
countries would not be particularly well-prepared for a chemical incident emergency and that they may have a propensity to panic. They key difference in expectations was that UK health responders expected members of the public in the immediate area to be largely compliant with instructions to shelter in place or evacuate, whereas Polish health responders expected a non-compliant response. Participants in both countries demonstrated awareness of some widely accepted principles of crisis communication, including the provision of simple, practical advice about protective actions and medical facts, and UK participants also recognised the importance of providing accurate and consistent information. However, some non-optimal current communication practices were identified, including potential over-emphasis on reassurance (UK) and intention to withhold unpalatable information (Poland).

On-line surveys of nationally representative samples of members of the public in the UK and Poland were conducted to ascertain whether public behavioural intentions are in line with health responders’ expectations and to explore factors that may enhance or reduce the likelihood of public compliance with official advice. The chemical incident scenario developed for focus groups was adapted for use in the survey. Participants (n=1203) were informed there had been a collision between two tankers at a local petrol station, resulting in the release of chlorine gas, and that the official advice was to stay indoors with doors and windows closed for the next 8 hours. Participants were randomly allocated to one of three conditions, in which this advice was presented as a precautionary measure (reassurance condition), as necessary due to potential for severe health effects (worst case scenario) and without a rationale for the advice (control condition). Participants were asked if they would engage in each of five behaviours should the incident occur (a) if they were at home, or (b) if they were in a local post office in order to explore the impact of ease of compliance on intended behaviours. One behaviour followed official advice to shelter in place and all others were incompatible with following this instruction.

Survey findings confirmed focus group participants’ expectations regarding non-compliance, in particular the intention to collect children from school and check on others, despite instructions to stay in place and shelter. Location had an impact on all intended behaviours, with all participants more likely to comply if they were at home when the incident happened. Responses were largely unaffected by the style of message presentation. Coping appraisals were a key predictor of compliance, but threat appraisals were associated with non-compliant behaviour. Trust was also associated with intention to comply with official advice, and anxiety motivated behaviour. UK participants were significantly more likely to fully comply with instructions to shelter in place than Polish participants.

Overall we found sufficient similarities in procedures and behavioural intentions to suggest that generic principles of risk and crisis communication would be applicable in the UK and
Poland. However some differences in communication practices and public intentions were identified, which suggests that generic guidance will need to be adapted to take into account local concerns and likely behavioural responses. The large impact of coping appraisal on intention to comply with official instructions strongly suggests that for crisis communications to be successful they must address public concerns regarding the efficacy of recommended behaviours, perceived difficulties in their ability to follow the advice and perceived costs of following recommended behaviours.

**Important Statement**

KCL agree that information can be used by the Commission within the framework of its Information and Dissemination Strategy, but KCL would like to ask the Commission to contact the work package lead (Brooke Rogers) if they plan to disseminated the results of the research activities of the project in the near future, as wide dissemination of the content of the report may prejudice papers that are currently in preparation for peer-reviewed academic journals.
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This report presents the findings of the CIE Toolkit Work Package 8: Risk and crisis communication requirements following a chemical incident or emergency. The objective of this work package was to enhance preparedness of Member States in responding to a chemical incident or emergency by improving the level of understanding of the needs and care of both health care responders, and affected populations. This work package was conducted in four stages:

1. A literature review exploring risk perceptions and current behavioural responses to health impacts of chemical incidents (planned and accidental), the impact of risk communications on these variables, and existing programmes for responding to chemical incidents.

2. Focus groups with health care responders in order to determine their information needs and concerns through the course and aftermath of a chemical incident, as well as their knowledge of existing plans for responding to the event and communicating with members of the public.

3. A survey of members of the public to ascertain their levels of trust and predicted behavioural response to the existing emergency response plans and messages identified in the focus groups.

4. Guidance for risk communication, provided in a series of mini risk-fora with emergency responders from across a range of emergency services such as police, fire and ambulance services, and in a training module in the CIE training manual.

The first three stages are presented in this report. Section 3 of this report presents the findings of the literature review, which explains the importance of effective risk communication, describes chemical incident emergencies, summarises the current literature addressing public perceptions of risk with a focus on chemical incidents and discusses the information and messaging needs of members of the public during such events. Section 4 of this report identifies CIE responders and procedures in the UK and Poland. This information
was used during the development of focus groups to identify the sample pool and establish whether it would be necessary to adapt the scenario to the specific context of each country.

Section 5 describes the design and outcomes of a focus group study conducted with health responders (fire services, police, ambulance, local authorities, and hospitals). The focus groups were designed to explore health responders’ information needs and concerns, communication strategies and perceptions regarding public information needs and responses in relation to a chemical incident. Cross-cultural comparisons are made and the implications of expectations about public behavioural responses for risk communication practices are discussed.

Focus group data informed the development of an online survey which was conducted to ascertain whether public behavioural intentions are in line with health responders’ expectations and to explore factors that may enhance or reduce the likelihood of public compliance with official advice. Section 6 describes the design and outcomes of the survey and discusses implications for communicating with the public during and following a chemical incident emergency. Section 7 considers the overall implications of this work package and provides recommendations for risk and crisis communications following a chemical incident emergency.
3. LITERATURE REVIEW

3.1 The importance of effective risk communication

‘(...) the timely and effective flow of information between agencies and the public is vital for facilitating and encouraging appropriate protective actions, reducing rumours and fear, maintaining public trust and confidence, and reducing morbidity and mortality’ (Becker, 2004, p. 197).

Effective public communication forms an essential part of any emergency response programme. Rogers et al. (2007) argued that effective risk communication can 1) encourage appropriate protective actions; 2) facilitate relief efforts; 3) maintain public trust and confidence in the agencies responsible for responding to the incident; and 4) reduce rumours and fears in order to reassure those who are not directly at risk (p. 279). Failure to recognise the importance of the link between risk communication, the public perception of risk, and behaviour can have serious consequences as risk perceptions, especially those that cause fear, have important implications for both physical and psychological health (Becker, 2004, Gray & Ropeik, 2002; Gigrenzer, 2006; Rogers et al., 2007; Wray et al., 2008).

Examples of failed risk communication on the part of authorities during both non-emergency and emergency situations abound. These range from non-lethal (to humans) incidents, such as the railroad chemical disaster in Northern California (Bowler, Mergler, Hue & Cone, 1994), to the radioactive incident in Goiania, Brazil in 1987 (IAEA, 1988) where large numbers of unexposed people sought monitoring and reassurance, to the Bhopal chemical

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1 Sections 3 & 4 of this report originally appeared in Section 10 of the CIE interim report, November 2009 and were authored by Brooke Rogers and Katerina Tasioplolou

2 For additional information, see Becker, 2004; Fischhoff, Riley, Kovacs and Small, 1998; Fischhoff, Bostrom & Quadrel, 1993; Gray and Ropeik, 2002; Henderson, Henderson, Raskob & Boatright, 2004; Kasperson & Kasperson, 2005; Rogers, Amlöt, Rubin, Wessely and Krieger, 2007; Sheppard, Rubin, Wardman & Wessely, 2006; Wessely, 2005; Wray and Jupka, 2004; Wray, Kreuter, Jacobsen, Clements and Evans, 2004, and more.

3 A freight train derailed and a railroad tank car containing a toxic pesticide (metam sodium) fell into the Sacramento River. During the first 6 days, 483 downstream residents evacuated their homes and attended refuge centres, while others left and stayed with family or friends elsewhere. A total of 848 people sought medical aid, with 278 attending the emergency room or hospital (Bowler, et al., 1994, p. 602).

4 112,000 people sought examination for symptoms indicative of radiation poisoning (vomiting, blisters, burns, and more), when the true impact of the incident was limited to four deaths and 260 contaminations.
plant disaster in India in 1984, where the actual level of injury, contamination and death is still hotly contested\(^5\) (Bowander, Kasperson and Kasperson, 2005, IPCS, 1999). In spite of the cause of each event, health professionals would recognise a familiar trend as, during all of these events, members of the public reported symptoms of exposure, whether they came into contact with the contamination or not. This has led researchers to suggest that the idea of the agent has the potential to be as harmful as the agent itself during many environmental incidents. In fact, the public perception of the risks posed by environmental incidents such as industrial accidents are so powerful that ‘(...) the impact of episodes in which there is no actual environmental hazard at all but only the perception of the such a threat can be as damaging as those in which there is at least some chemical exposure’ (Page et al., 2006, p. 413).

In order to address the repeated failure to effectively communicate about the risks of industrial hazards and disasters, we must understand how members of the public perceive the hazard. Therefore, we need to develop an informed understanding of the psychology of the public, especially in reference to their perception of the risk of exposure to hazards and its influence on behaviour. Failure to understand the psychology of the public in respect to risk, means that our plans are unlikely to be realistic (Fischhoff, 2002; Fischhoff, Bruine de Bruin, Perrin and Downs, 2003, Rogers et al., 2007).

As this deliverable aims to progress our understanding of the likely public health and behavioural responses to the exposure of chemicals in order to aid and inform the professional health response to chemical incident emergencies, we begin by defining chemical incident emergencies, identifying their health effects, and broadly discussing well-known risk dynamics with a focus on the public perceptions of risk and chemicals. Finally, we discuss emergency response issues surrounding chemical incident emergencies and explain the public information needs during such events. This information will be used to shape the information and messages developed in partnership with health responders in the focus groups before being tested with members of the public via a survey.

### 3.2 Hazards and risks

Before progressing, it is important to recognise the difference between risk and hazard. Hazards are broadly understood as threats to human beings and the things that they hold dear or value (e.g. health, physical goods, environment, and future generations). Risk, on

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\(^5\) Estimations range from a few thousand exposed up to 200,000. Some experts estimate 1,762 fatalities, with others arguing a more widely accepted estimate of 2,500.
the other hand, is ‘(...) the probability that a particular technology or activity (automobile driving) will lead to a specific consequence (death from crashes) over time or activity unit (one driving year)’ (Kasperson & Pijawka, 2005, p. 31). When communicators speak about risks, they are speaking about the likelihood of being exposed to a given natural or technological hazard based on location/proximity to that hazard, and activities which heighten or decrease the likelihood of coming into contact with the hazard. When experts discuss public perceptions of risk, they are interested in the public level of awareness of particular hazards, as well as the belief or perceived likelihood of that hazard impacting an individual’s life.

Issues and controversies related to harming the natural environment or the human body through modern technologies are at the forefront of public perceptions of risk, meaning that the interactions between humans and hazards are anything but straightforward (Wildavsky & Dake, 1998). The difference in the origin of the hazards (i.e. natural or man-made) has a strong impact on the public perception of risk, as well as the public response to disasters caused by those hazards. ‘Members of the public tend to see natural hazards as acts of God whose effects can only be mitigated; technological hazards, especially those associated with new technologies or those that are imposed, are assumed to be amenable to ‘fixes’ of various kinds and amenable to substantial reduction’ (Kasperson and Pijawka, 2005, p. 30).

In fact, the public fear of man-made events is sometimes viewed as irrational, given that the events of nature (e.g. floods, drought, disease, earthquakes, and more) are responsible for the largest loss of human life throughout the history of mankind. This does not bode well for the public response to chemical hazards.

In the modern world, technology has played a large role in reducing the impact of natural events and hazards, thus extending the lifespan of populations around the world. In spite of this contribution, technology has also emerged as a primary source of global hazard, as evidenced across a number of industries (Kasperson and Pijawka, 2005). Kasperson and Pijawka (2005) identified three generic types of technological hazards (p. 39) as illustrated in Table 1:
Why is it important to study chemical incident emergencies (CIEs) when discussing the public perception of risk and hazard? Considered to be a type of technological hazard, CIEs can take many forms and their impact/outcomes upon individuals, populations and environment vary greatly.

### 3.3 Chemical Incident Emergencies

The UK Chemical Hazards and Poisons Division (ChaPD) of the UK Health Protection Agency (HPA) define a chemical incident as, ‘An acute event in which there is, or could be, exposure of the public to chemical substances which cause, or have the potential to cause, ill health’ (HPA, 2005, p. 6). In fact, 'The chemical revolution of the 20th century has produced widespread exposure of workers and publics to a number of known carcinogens and a larger number whose toxicity remains unassessed' (IPCS, 1999; Kasperon and Pijawka, 2005, p. 29). For the purpose of this project, we believe that ‘A chemical incident will typically be acute, although there is the distinct possibility that any such emergency will involve the contamination of food, land or water supplies resulting in a chronic incident’ (Duarte-Davidson & Griffith, 2008, p. 2; IPCS, 1999).

A variety of documents about the likelihood and occurrence of chemical incidents exist. The majority have medical or military backgrounds, with very few being suitable for public consumption. Many review past incidents in order to identify lessons learned and contain discussions of large-scale modern incidents such as the Buncefield oil depot incident in the

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6 Please refer to Murray & Goodfellow (2002) for a discussion of naturally occurring mass casualty chemical incidents, which falls outside of the remit of this paper.

7 See Eckstein, 2008; Murray & Goodfellow, 2002; IPCS, 1999.
UK in 2005; acts of terror, such as the Sarin attacks on the Tokyo subway system (2005) and the Anthrax attacks in the USA during 2001; and everyday chemical spills around the world. Incidents vary by agent and toxicity of agent, as well as type of release. Chemicals can be spilled, accidentally or purposefully released into land, water or air, leaked, and/or deposited. Incidents can occur across a variety of locations, including transport, agriculture, residential, open spaces, industrial, health care, educational, and commercial areas (HPA, 2005; IPCS, 1999). Table 2 summarises the chemical groups that can be involved in chemical incident emergencies.

<table>
<thead>
<tr>
<th>Chemical Groups</th>
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<tbody>
<tr>
<td>Acids</td>
<td>Halogens</td>
<td>Pesticides</td>
</tr>
<tr>
<td>Ammonia</td>
<td>Metals</td>
<td>Petroleum/oils</td>
</tr>
<tr>
<td>Asbestos</td>
<td>Natural gas</td>
<td>Products of combustion</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>Other inorganic</td>
<td>Unknown</td>
</tr>
<tr>
<td>CS Gas</td>
<td>Other organic</td>
<td></td>
</tr>
<tr>
<td>Cyanide</td>
<td>Particles</td>
<td></td>
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</tbody>
</table>

The diverse nature of these chemicals and their various forms of release complicates the process of developing useful messages for CIEs.

### 3.4 The Health Impacts of Chemical Incidents

Much of our knowledge about the physical and psychological effects of exposure to chemical agents comes from military settings. Large knowledge gaps exist, and some of the knowledge gained from studies conducted with highly trained military personnel is thought to be applicable to a civilian population, but to an unknown degree. As a result, the amount of scientific work conducted to establish safe criteria for public exposure to chemical or biological weapons is limited (Lockwood, 1997; Raber et al., 2001). In spite of these stumbling blocks, the psychological effects of chemical warfare agents can be summarised under the three main headings found in Table 3.

<table>
<thead>
<tr>
<th>Psychological Effects of Chemical Weapons</th>
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<tr>
<td>(Lockwood, 1997, p. 88):</td>
<td></td>
</tr>
<tr>
<td>1) Effects associated with actual use of the agents.</td>
<td></td>
</tr>
<tr>
<td>2) Effects associated with impending or threatened use.</td>
<td></td>
</tr>
<tr>
<td>3) Effects associated with presence of the agents and plans for their destruction.</td>
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</tbody>
</table>
In terms of physical health effects, ‘Chemical agents disrupt normal physiological function of various organ systems (e.g. blood, cognitive, lacrimal, respiratory, dermatologic, digestive and nervous’ (Henderson, Henderson, Raskob & Boatright, 2004, p. 225). Physical symptoms experienced by military personnel taking part in chemical training exercises can also shed some light on the types of symptoms that might occur in a civilian population exposed to chemical war agents (Lockwood, 1997). These include, but are not limited to those listed in Table 4. In general, the effects of chemical weapons are typically immediate (Eckstein, 2008, p. 59) and exposure to chemical war agents can cause death. Low-dose exposure to agents such as nerve gas can also produce a variety of short and long-term symptoms.

<table>
<thead>
<tr>
<th>Shortness of breath</th>
<th>Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of the sense of time</td>
<td>The urge to micturate</td>
</tr>
<tr>
<td>Poor concentration</td>
<td>Auditory hallucinations</td>
</tr>
<tr>
<td>Nausea</td>
<td>Disorientation</td>
</tr>
<tr>
<td>Tremor</td>
<td>Impaired judgement</td>
</tr>
<tr>
<td>Irritability</td>
<td>Disturbed vision</td>
</tr>
<tr>
<td>Confusion</td>
<td></td>
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</tbody>
</table>

In addition to these more immediate symptoms, chemical exposure can also produce long-term chronic effects such ‘(...) skin scarring and disfigurement from burns, respiratory difficulties from damage to the lining of the lungs, and so on. Delayed effects occur mainly as cancers or teratogenic effects – problems appearing in the offspring during fetal development’ (IPCS, 1999, p. 15). Chemical emergency incidents can also affect the national economy, force the closure of contaminated health facilities and require decontamination of food, land, and more (IPCS, 1999).

The lack of evidence-based knowledge about the physical effects of chemical exposure effects our ability to respond appropriately. For example, Eckstein (2008) identifies the need to become familiar with the signs and symptoms associated with chemical warfare as the impact of an attack using an agent such as cyanide would overwhelm the capacity of emergency rooms to respond effectively, not least because of the limited supplies of Cyanide Antidote Kits. He claims, 'Most hospitals do not have the capability to perform laboratory tests to determine the presence of cyanide in blood specimens. As a result, it would be incumbent upon emergency physicians to make a clinical diagnosis based upon common signs and symptoms’ (p. 64). However, ‘There is a substantial overlap of symptoms caused by the real effects of nerve agent exposure and the symptoms reported
during chemical warfare training exercises‘ (Lockwood, 1997, p. 89). There is a danger of some individuals mistaken psychologically caused symptoms for the real symptoms of nerve agents and mis-medicating, which poses a new risk.

In conclusion, chemical incident emergencies are classified as technological, man-made hazards. This classification has implications for the public understanding of, perception of, and response to chemical incidents in general. It is also evident that the term chemical incident emergencies (CIE) can include a variety of agents released or introduced into the environment via a multitude of pathways with a wide range of health and environmental impacts. Adding this level of diversity and complexity to a technological, man-made threat has implications for the way in which health professionals and health organisations communicate about the risks of the hazards before, during and after an incident, especially as research and experience suggests that the idea of the agent can be as harmful as the agent itself (i.e. exposure does not have to occur). To date, very little is known about the psychological and physical response to chemical incident emergencies. Current information is based on the perceptions and experiences of highly trained soldiers and little is known about the public response to these events. The few existing attempts at communication are inward facing military and government health documents unsuitable for public consumption. This lack of evidence-based knowledge impacts the effectiveness of our emergency response plans and procedures and leaves us questioning: How will members of the public view and respond to such a diverse hazard?

3.5 The Psychology of Risk Perception

A specific focus on chemicals suggests that ‘(...) the rapid industrialisation of the last century, the increasing numbers and volume of chemicals produced in this century, and the growing global market in chemicals of the recent decades has accelerated dramatically the range of chemicals and types of exposure experienced by individuals and populations’ (IPCS, 1999, p. 4). Public awareness of the growing threat of chemicals has increased in light of major chemical incidents, leading to increasing levels of concern about exposure as well as fear and panic responses to chemical incidents (IPCS, 1999).

What the public perceives, why they perceive it in that way, and the impact that these perceptions have on public behaviour are issues that hold a high level of importance for industries and governments trying to assess and implement technologies (Peters, Burraston, Mertz, 2004). Risk perception research can be applied to policy making and hazard management in order to help experts understand public attitudes and forecast the likelihood of acceptance or rejection of new technologies (Lofstedt, 1991; Slovic, Fischhoff, and
Lichtenstein, 1981a; 1981b) and aid response activities when the technologies fail (Kasperson & Pijawka, 2005).

Society and technology exist in a unique dynamic, where society is dependent upon technological advances to prolong and enrich the lives of individuals around the world, yet some technological advances can have the opposite effect by shortening the life of some, and threatening the health, safety, and quality of life for all. In the past, this risk-benefit trade-off was balanced and decided upon by experts, industry and regulators. The tide began to change, however, as early as 1936, with the founding of the Consumers Union in the United States, which heralded the beginning of public involvement in the technology risk-management process (Gould, Gardner, DeLuca, Tiemann, Doob, and Stolwijk, 1988). Since then, the impact of increased public involvement has been felt far and wide. Consequently, public awareness of a variety of risks and hazards has increased, causing the acceptable level of some risks to increase, while others have decreased. Additionally, in the modern world, modern media technologies enable individuals to experience hazards that they would not encounter in their everyday lives. Exposure to risk without direct experience can seriously distort their perception of risk which leaves individuals feeling that they are exposed to a larger number of risks than in the past (Slovic, 1987; 1991; Slovic et al., 1981; Tanaka, 1998). The increase in public involvement in risk management has served to increase the levels of protection afforded by safety standards, while, at the same time, complicating the already complex process of risk-regulation, risk communication and risk management (Gould et al., 1988). Understanding the issues that members of the public take into account when making these risk decisions is important, as members of the public base their perceptions of risk on several common issues when deciding upon the acceptability of given risks or hazards. This is because individuals fear similar things for similar reasons (Fischhoff et al. 1979; Gould et al., 1988; Weisath & Tonnessen, 2003; Rogers et al., 2007).

**Table 5: Expert Perceptions of Risk (Quantitative Factors)**

- Can I identify a clear cause and effect relationship?
- Can I quantify the amount of harm?
- Do I suspect a hazard, based on past experience?
- Is there a possibility of an accident?
- Is there possible exposure to the risk (e.g. pollutant/violence)?
- Is there evidence of damage?
It is fair to say that experts and members of the public approach risk and hazard in completely different ways, with experts building their risk analysis and risk dialogues around quantitative issues (Table 5) and members of the public building their risk analysis and dialogue around qualitative issues (Table 6) (Beck, 1999; Wedemann et al., 2003; Fischhoff et al., 1979; Gould et al., 1988; Weisaeth & Tonnessen, 2003; Rogers et al., 2007).

This creates a situation where, when risk communication does occur, experts and members of the public are left comparing apples and oranges, or ‘(…) speaking different languages, solving different problems, disagree about what is feasible, an see the facts differently’ (Tanaka, 1998, p. 248). The variation between scientific experts and members of the public can be seen in a study investigating expert and public perceptions of radiation and chemicals. In this case, toxicologists (experts) viewed the dose response of a chemical exposure as important, whereas members of the public simply believed that a chemical was safe or unsafe (Kraus, Malmfors and Slovic (1992) as cited in Page et al., 2006).

<table>
<thead>
<tr>
<th>Qualitative Factor</th>
<th>Decreased Public Concern</th>
<th>Increased Public Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Personal controllability</td>
<td>Controllable</td>
<td>Uncontrollable</td>
</tr>
<tr>
<td>2 Catastrophic potential</td>
<td>Fatalities random and scattered</td>
<td>Fatalities grouped in space and time</td>
</tr>
<tr>
<td>3 Dread</td>
<td>Effects not dreaded</td>
<td>Effects dreaded</td>
</tr>
<tr>
<td>4 Familiarity</td>
<td>Familiar</td>
<td>Unfamiliar</td>
</tr>
<tr>
<td>5 Understanding</td>
<td>Mechanism or process understood</td>
<td>Mechanism or process not understood</td>
</tr>
<tr>
<td>6 Effects on children</td>
<td>Children not specifically at risk</td>
<td>Children specifically at risk</td>
</tr>
<tr>
<td>7 Manifestation of effects</td>
<td>Immediate effects</td>
<td>Delayed effects</td>
</tr>
<tr>
<td>8 Effects on future generations</td>
<td>No risk to future generations</td>
<td>Risk to future generations</td>
</tr>
<tr>
<td>9 Reversibility</td>
<td>Effects reversible</td>
<td>Effects irreversible</td>
</tr>
<tr>
<td>10 Victim identity</td>
<td>Statistical victims</td>
<td>Identifiable victims</td>
</tr>
<tr>
<td>11 Trust in institutions</td>
<td>Trust in responsible institutions</td>
<td>Lack of trust in responsible institutions</td>
</tr>
<tr>
<td>12 Media attention</td>
<td>Little media attention</td>
<td>Much media attention</td>
</tr>
<tr>
<td>13 Accident history</td>
<td>No major or minor accidents</td>
<td>Major and sometimes minor previous accidents</td>
</tr>
<tr>
<td>14 Voluntariness of exposure</td>
<td>Voluntary</td>
<td>Involuntary</td>
</tr>
<tr>
<td>15 Equity</td>
<td>Equitable distribution of risks</td>
<td>Inequitable distribution of risks</td>
</tr>
<tr>
<td>16 Benefits</td>
<td>Clear benefits</td>
<td>Unclear benefits</td>
</tr>
<tr>
<td>17 Origin</td>
<td>Caused by acts of nature or God</td>
<td>Caused by human actions or failures</td>
</tr>
</tbody>
</table>
If we explore Table 6 in light of CIES, the majority of qualitative factors influencing public perceptions of risk demonstrate the potential for chemicals and their associated incidents to increase public concern. Chemical incident emergencies are all the more frightening as ‘(...) they have the potential to cause large numbers of deaths and disabilities and because they raise questions about the fragility of technologies over which society, and the local community in particular, may lose control’ (IPCS, 1999, p. 4). Additionally, exposed populations are unfamiliar with the agents, do not choose to be exposed, have little to no control or little faith/trust in those responsible for managing chemicals over the management of chemicals in their area, have a low level of understanding about the potential health impacts of chemical exposure and or little faith/trust in the level of understanding for those responsible for managing chemicals, view chemical hazards as man-made, and more. In fact, chemical incident emergencies have the potential to fall into the category known as ‘dread risk’ meaning that they can have catastrophic potential, fatal consequences, uncontrollable, are seen as inequitable, and pose a high risk to future generations.

These qualitative indicators can be applied to a variety of natural and technological risks and contribute heavily to the risk matrix, one of the primary tools for plotting the a range of hazards based on unknown and dread (Figure 1). The risk matrix enables the comparison of risk perceptions. The matrix includes a general focus on products and substances individuals come into contact with during the course of an average day (e.g. hair dyes, lead paint, etc.), as well as a few well-known dread risks such as radioactive waste. Findings from the risk matrixes have led many researchers to question why individuals tend not to react strongly to a risk that might be present in everyday life, while ‘overreacting’ in the face of risks that are much less likely to occur and seen as highly unlikely, or a minimal threat by experts (Slovic, et al., 1979, 1980, 1981, and 1985; Bouder et al., 2006).
Once again, it is easy to see the role that the qualitative drivers of risk perception (Table 6) play in informing public perceptions of risk. Note the placement of chemicals such as asbestos insulation, pesticides, and nitrogen fertilizers in the top, right-hand quadrant. Elements in this quadrant are seen as unknown/unfamiliar, and fulfil a number of the dread risk criteria. This adds strength to the previous discussion about the impact of natural vs. man-made hazards, as man-made traumatic events that are unexpected, sudden and violent have a greater negative impact on perceptions of risk than natural disasters (Danielli et al., 2005). In fact, chemical incidents such as the chemical spills/cover-ups at Love Canal\(^8\) and

\[^{8}\text{Love Canal, USA: Hooker Chemical buried 21,000 tons of toxic waste was found buried under a neighbourhood in New York. The School Board and urban planning committees were aware of the threat yet chose to construction of a school and houses upon the tainted land. This development released the chemicals and caused a health emergency. Residents complained of high rates of health problems (miscarriages, mental deformities, breathing difficulties, nervous disorders and more) and noted strong odours and residue/substances in their yards and basements. In fact, 56% of children born between 1974 and 1978 had birth defects.}\]
How do the technological risks such as the chemical concerns illustrated in this risk matrix translate into day to day public concerns? They do not. In spite of the potential of chemical incidents to tick all of the qualitative ‘fear and dread’ boxes, they do not appear on the public perception of risk radar in day-to-day life. To the contrary, Eurobarometer (2008b) figures indicate that the majority of concerns/public perceptions of risk tend to focus on non-technical social issues such as rising prices, unemployment, crime and health (Eurobarometer (2008b), p. 21), as illustrated in Figure 2.

In spite of the fact that technical risks are not identified as one of the top public day-to-day concerns, the higher ratings assigned to social and economic (non-technical) risks do not indicate that individuals perceived technical facilities as safe. Further analysis illustrates that, when asked directly about the technologies that are the most likely to cause a serious accident, members of the public believe chemicals plants have the potential to cause a serious accident or disaster, as illustrated by a poll conducted with the Belgium population in 2002 (Carle et al., 2004).

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9 Times Beach, USA: An entire town was evacuated due to a company spraying dusty roads with chemicals containing levels of Dioxin 2,000 times higher than the Dioxin content in Agent Orange. A flood spread the chemicals further afield. Evacuated residents were shunned by their new communities because of fear of contamination. Evacuees are still dealing with the fear of long-term health effects.
More recently, polls indicate that, when the risk perception is framed within environmental terms, man-made disasters (major oil spills or industrial accidents (39%) and water pollution (seas, rivers, lakes and underground sources), rank fairly high amongst the public’s perception of risk across the EU (Figure 4).
It appears that growing concerns about other risks such as climate change impacted the status of a number of technologically-based incidents, but it will only take one memorable chemical incident emergency to shift these figures again. Figures 2 & 4 also illustrate the power of framing and the impact of time/current events on public concerns and perceptions of risk.

Finally, members of the public also make risk evaluations on how they feel, as dictated by the perceived risks or benefits of an activity or a technology. As a result, individuals tend to
rate the risks as low if they view the activity or technology as favourable (e.g. driving a car in spite of the risk of accidents/road fatality stats), or rate the risks as high if they view the activity or technology in negative terms. Risk communicators must be able to communicate both the risks and benefits of a technological choice (Alhakami & Slovic, 1993; Slovic et al., 2004; Slovic, 1987; Slovic et al., 1981; Tanaka, 1998, Rogers et al., 2007).

It is important to understand that the public awareness of hazards and their perception of the risk of those hazards before entering into risk communication as experts and members of the public often approach these issues from very different perspectives. Chemical incident emergencies have the potential to ‘tick’ all of the public fear and dread ‘boxes’ or variables, underscoring the importance of developing effective communication in this area. However, the placement of chemical hazards on the risk matrix, and the repeated flagging of chemical incident concerns when questioned directly about serious accidents or negative environmental impacts send conflicting messages when combined with the lack of public concern about these issues in their day-to-day lives. Is it possible to communicate both the risks and benefits of industrial technologies and their associated hazards in order to create a better informed and better prepared public before an incident takes place? Would this type of communication have the potential to change the placement of some of the chemical risks on the public risk matrix? How should organisations responsible for managing industrial hazards such as chemicals go about discussing their new technological developments with members of the public?

3.6 Communicating with the Public about the Risks and Benefits of (New) Technologies Prior to an Incident

While the Control of Major Accident Hazard (COMAH) Regulations 1999 ensure the inspection and regulation of all major hazard sites (NRR, 2009) such as chemical facilities, public information about the agents contained within those facilities is often the responsibility of the industrial organisation. Information does exist, but once again, this appears to be inward-facing and military or industry specific. In the case of pre-event messaging, Eiser (2004) proposes that the critical issue to the public in respect to technological risks is not whether any risk is actually present, but whether the risk is perceived as being more serious than the risk that went before (p. 57). Organisations must focus on building trust through the provision of information about the hazards contained within the facility as well as steps that have been taken or steps that can be taken to lower the risk of exposure to the hazard.

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10 See Section 3.4 for a discussion of the difficulties of applying current CIE knowledge of health impacts to a civilian population. See also: Bowander et al., 2005, Eckstein, 2008; Lockwood, 1997; Murray & Goodfellow, 2002; IPCS, 1999; Raber et al., 2001
This, in itself, poses problems for health organisations when it comes to talking about risks and hazards that are often managed by private organisations. Additionally, communication from a private organisation to a community might not be an effective form of risk communication in the case of chemical incident emergencies as chemical incidents can happen away from the production and storage site (e.g. in transport), resulting in a mobile and, at times, cross-border hazard. Eiser’s advice is appropriate when it comes to communicating with the public about complex, technological hazards on a daily basis, but it appears that public information needs are very different during an emergency, which is the point where public health organisations often become the primary source of information for what is, oftentimes, and industrial risk.

3.7 Emergency Response to Chemical Incident Emergencies: Addressing the Public Information Needs

A familiar trend impacting the public physical and psychological impacts of the previously mentioned disasters is the perception that emergency response organisations, governments, and communities are ill-prepared for such an event. In the case of Bhopal, local officials had not been provided with emergency manuals and evacuation plans, and neither the officials nor the hospital offices were aware of the toxic substances used in the plant. Exposure took place before a warning siren sounded, and public warnings were not issued (Bowander et al., 2005). In the case of the Northern California railroad disaster, the scientific evidence about the health effects on humans of metam sodium was sparse, resulting in confusing and conflicting reports by government officials. Finally, in the case of Goiania, Brazil, the official information was full of contradictions and indicated a lack of technical knowledge. Members of the public quickly linked their understanding of the situation to a much larger incident, Chernobyl, and reacted accordingly (IAEA, 1988; Fullerton, Ursano, Norwood & Holloway, 2003; Becker, 2004; North, 2005; IPCS, 1999).

This lack of preparedness on the part of emergency response organisations, governments, and members of the public can be attributed to the fact that risk and hazard information surrounding the likelihood and impact of industrial/environmental disasters can be inward facing, or designed to suit the needs of industry (i.e. the management of threats), not communicated to emergency response organisations, health organisations or local authorities, and not appropriate for communication in a public setting. In addition, when the information is shared with emergency response organisations and government bodies, preparedness plans are often build upon limited data about the health effects and impact of such agents. As a result repeated calls for improved communication and engagement with public health officials and members of the public are issued (Eckstein, 2008 Etchegary, Lee,
Lemyre & Krewski, 2008; Han, Walker & Kuri, 1999; IPCS, 1999; Kaspersion and Pijawka, 2005; Murray & Goodfellow, 2002; Raber, Jin, Noonan, McGuire and Kirvel, 2001). In spite of the vast number of calls for additional engagement with public health managers and members of the public, as well as the development of various guidelines for community response and communicating with the public, very few studies appear to progress beyond the recognition of the importance of communication with members of the public and recommendations for change\(^{11}\).

Chemical incident emergencies are fairly unique as public health emergencies always present public communication challenges, but ‘(...) emerging, unfamiliar, unidentified, or intentionally released agents such as radioactive ‘dirty bombs’, chemical terrorism, and avian influenza, can pose even greater communication difficulties for public health professionals’ (Wray et al., 2008, p. 2214). Once again, the differences between natural and man-made hazards must be taken into consideration as the differences in the characteristics of natural and man-made hazards means that after emergency responders detect and evaluate the threat, the actual management of the disaster can vary greatly. For instance, technological disasters are more likely to occur without warning, compared to the majority of natural hazards, such as flooding caused by heavy rains, hurricanes, or even the spread of many diseases. Technological emergencies can also be very sudden, meaning that identification, assessment and reaction may have to happen in an exceptionally small window of time (Kasperson & Pijawka, 2005). ‘In such a context, communication about threats, safety and health, and about protective actions becomes a life-or-death matter. Effective communication is a complex and difficult problem in the context of technical disasters or terrorist events’ (Henderson, et al., 2004, p. 225). Most communities will not have the required equipment for identifying this type of hidden contamination. As a result, ‘Lack of familiarity with technological hazards, generally low levels of community awareness and preparedness, the rapid onset of the hazard event, and the potential for secondary consequences present critical problems for emergency managers’ (Kaspersion & Pijawka, 2005, p. 42). This uncertainty and lack of familiarity associated with technological risks also have the potential to alter the public response and increase public dependence upon government and health authorities. As a result, some authors have noted a reduced reliance upon social networks, and an ‘over-response’ by members of the public (e.g. willingness or desire to evacuate even if risk is minimal) during an incident (Kaspersion & Pijawka, 2005; Page et al. (2005)).

\(^{11}\) Two notable exceptions are the Pre-Event Message Programme from the USA and a UK Home Office Study investigating the Public Psychological and Behavioural Responses to CBRN Terrorism.
Fortunately, a number of studies indicate that every disaster, regardless of agent, includes the same phases of social response (Lindell and Perry, 1980, as cited in Kasperson and Pajawki, 2005). These include:

1) Threat detection
2) Threat evaluation
3) Information dissemination

This is supported by others, as illustrated by Eckstein's (2008) claim that '(...) the same skills, methods, and resources necessary for enhancing preparedness for chemical attacks are necessary for identifying and managing non-terrorism-related chemical accidents: therefore, efforts by public health organizations and health care providers to enhance readiness for chemical terrorism should also enhance the capability to recognize and respond to chemical injuries arising from causes other than terrorism' (p. 62). These findings provide guidance about the types of messages that must be given out to members of the public before, during and after a CIE. Fortunately, research indicates that the messages required during an incident do not necessarily need to be agent-specific. For example, in their comparison of the public understanding of and responses to a variety of CBRN agents, Wray et al. (2008) found that, ‘(...) overall, the findings were consistent across agents and populations and with previous research on risk communication (...)’ (p. 2217). This also adds support Page et al.’s (2006) argument that it is not the agent itself, but the thought of the agent that causes public concern. Therefore, guidance targeted at minimising harm to participants is urgently required during a chemical incident emergency (Murray & Goodfellow, 2001).

What type of information should these messages contain? When discussing a scenario of chemical (VX) terrorism with members of the public, Henderson et al. (2004) reported low levels of public knowledge and a strong need to know where to obtain information in order to be prepared. The lack of knowledge and lack of familiarity with information sources created an information vacuum where a strong sense of fatalism or doubt about the survivability of exposure to such an agent existed. Henderson et al. (2004) warned that failure to counter this information vacuum ‘(...) with factual information about survivability, fatalism could lead to pessimism, inaction and other unnecessarily deleterious behaviors, even in the presence of less potent chemical agents’ (p. 228). In order to avoid the likelihood of increased levels of fatalism and pessimism created by an information vacuum, the authors summarized some of the key public information needs (Table 7) identified by members of the public.
Most importantly, messages about agent-related incidents such as chemical incidents must emphasise that: 1) Exposure can be avoided or reduced; 2) the effects of the agent can be treated; and 3) the agent can be survived (Henderson et al., 2004, p. 227).

In conclusion, pre-event messaging about chemical hazards and risks is likely to be an effective form of preparation for a well-informed public response to a chemical incident emergency. Unfortunately, existing information is often the responsibility of the industrial organisations that tend to create inward facing, complex and technical documents unsuitable for public consumption. Suggestions for effective pre-event communication were made, but emergency response organisations are more likely to communicate with members of the public during an event. These messages do not necessarily need to be agent-specific but must contain information about the current status of the incident, medical facts about exposure, protective actions, and treatment. In short, when facing an emergency, members of the public must have access to ‘detailed information about the nature of the threat, how to protect themselves and their families, and the official response to the situation’ (Wray, 2008, p. 2217). Finally, this information must be presented as ‘(...) practical, concrete action steps, clear and accurate information, and messages that were consistent and simple’ (p. 2219).
4. CIE RESPONDERS AND PROCEDURES IN THE UK AND POLAND

As outlined in Section 3, an important part of the response to any major incident rests on how the organisations and actors involved communicate relevant information to the public. This part of the report will therefore focus on the ‘actors’ of a chemical incident response in both the UK and Poland, identifying their organizational structure, roles and responsibilities.

4.1 UK response to chemical incidents

The legal framework in the UK for response to emergencies is stipulated by the Civil Contingencies Act (2004). The CCA replaced former legislation which had not been amended for decades. The first was the Emergency Powers Act 1920 which granted extra powers to the UK government in the event that services deemed essential in the 1920s were threatened. The second was the Civil Defence Act of 1948, which provided requirements on how public bodies should prepare for potential attacks by foreign powers. The weaknesses of these two acts were underlined when the need arose recently to respond to domestic threats to services (e.g. the fuel protests of 2000) and natural threats (e.g. mass flooding in 2000; outbreak of Foot and Mouth Disease in 2001) as the existing legal framework did not offer sufficient guidance and support (Walker & Broderick, 2006).

Currently, legal powers relating to contaminations are also being reviewed. These powers at present deal with communicable diseases and are enforced by local authorities with support and advice from the Health Protection Agency and the National Health Service. This law was designed to prevent the spread of communicable diseases referred to as “notifiable diseases”. The list of diseases (notifiable diseases) and powers are found in the Public Health (Control of Disease) Act 1984 (c. 22) and do not at present refer to illness caused by exposure to chemicals or radiation. The existing powers refer to children. For example, exclusion from school of a child liable to convey notifiable disease, and exclusion of children from places of entertainment or assembly. Further restrictions relate to infected articles; infected premises; public conveyances; infected persons; common lodging houses and deaths of persons suffering with notifiable diseases.

The legislation will be amended shortly to include the provisions in the World Health Organisation’s International Health Regulations (IHR, 2005). The purpose and scope of the IHR (2005) is no longer limited to the notification of specific diseases. States are now required to notify WHO of all events that may constitute public health emergencies of international concern. This instrument identifies a limited set of criteria that will assist Member States in deciding whether an event is notifiable to WHO.
The 2004 CCA defines an emergency as “an event or situation which threatens serious damage to human welfare in a place in the UK; the environment of a place in the UK or the security of the UK or a place in the UK.” (Civil Contingencies Act, 2004, p 1.). Given the variety of events that can be incorporated into this definition it is not surprising that the number and type of organisations responsible for emergency response in the UK varies greatly by type of incident. However, there are a few key response organisations for every incident. These organisations are then supported, informed and guided by the relevant responders involved in the topic or incident area.

There are several services in the UK involved in the response procedures to chemical incidents. These are separated into Category A responders (first responders) and Category B (second responders) based on the timing of their main role (See Figures 1 & 2). These categorizations can be flexible depending on needs (CCA, 2004).

**Figure 1: Timeline of response (UK)**

<table>
<thead>
<tr>
<th>Prevention stage</th>
<th>First Responders</th>
<th>Second Responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Agency</td>
<td>Local Authorities</td>
<td>Health &amp; safety Executive</td>
</tr>
<tr>
<td>HPA monitoring</td>
<td>Police trusts</td>
<td>Transport</td>
</tr>
<tr>
<td>Fire Services</td>
<td>ER NHS</td>
<td>Utilities</td>
</tr>
<tr>
<td>HART teams</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Especially of interest for this research are the first responders who would carry the main burden in case of a chemical incident. Their exact roles and responsibilities are outlined below:

### 4.1.1 Police

The primary areas of police responsibility at a major incident are:

- the saving of life together with the other emergency services;
- the co-ordination of the emergency services, local authorities and other organisations
- acting in support at the scene of the incident;
- to secure, protect and preserve the scene and to control sightseers and traffic through
- the use of cordons;
- the investigation of the incident and obtaining and securing of evidence in conjunction
• with other investigative bodies where applicable;
• the collection and distribution of casualty information;
• the identification of the dead on behalf of Her Majesty’s (HM) Coroner;
• the prevention of crime;
• family liaison; and
• short-term measures to restore normality after all necessary actions have been taken.

Figure 2: Category 1 and Category 2 responders (UK)

4.1.2 Fire Brigade

• The primary areas of FB responsibility at a major incident are:
• life-saving through search and rescue;
• fire fighting and fire prevention;
• rendering humanitarian services;
• detection, identification, monitoring and management of hazardous materials and
• protecting the environment;
• provision of qualified scientific advice in relation to HAZMAT incidents via their
• scientific advisors;
• salvage and damage control;
• safety management within the inner cordon; and
• to maintain emergency service cover throughout the LFB area and return to a state of normality at the earliest time.

Within the FB there are two further specialised units of interest:

**Chemical incident unit personnel**
Most of UK’s Fire Services have at least one chemical incident unit whose fire fighters have been trained to deal with emergencies involving hazardous materials and equipped with specialist equipment such as chemical containment and absorption materials, leak-sealing equipment, foam concentrate, pumps for pumping up industrial chemicals, and drain blockers. Key roles include the containment of spillages, decontamination and environmental protection.

**Urban Search and Rescue**
A national team of specialists designed to assist Fire Service in the event of a major incident – including CBRN. USAR teams consist of 16 whole time USAR Technicians, 14 on call USAR Technicians and 1-2 Search and Rescue Canines.

**4.1.3 Ambulance Services**
• to provide treatment, stabilisation and care of those injured at the scene;
• to provide treatment, stabilisation and care of those injured at the scene;
• to provide appropriate transport, medical staff, equipment and resources;
• to establish an effective triage sieve and triage sort system to determine the priority evacuation needs of those injured and to establish a safe location for casualty clearing, i.e. triage sort area;
• to provide a focal point at the incident for all National Health Service (NHS) and other medical resources;
• to provide communication facilities for NHS resources at the scene, with direct radio links to hospitals, control facilities and any other agency as required;
• to nominate and alert the receiving hospitals from the official list of hospitals to receive those injured and inform the other agencies;

• to provide transport to the incident scene for the Medical Incident Officer (MIO), mobile medical/surgical teams and their equipment;

• to arrange the most appropriate means of transporting those injured to the receiving and specialist hospitals;

• to maintain emergency cover throughout the LAS area and return to a state of normality at the earliest time; and

• to act as a portal into the wider health services including the Health Protection Agency Regional Health Emergency Planning Advisors, and in the event of a chemical, biological, radiological or nuclear incident advise on the convening of the Health Advisory Team (HAT), which will be able to advise and lead as far as health advice is concerned.

Of particular relevance is the newly established HART (Hazardous Area Response Team) project, funded by the Department of Health, initiated in 2005 to provide the ambulance service with the capability to work within the inner cordon at CBRN or HAZMAT incidents and other appropriate major incidents. There are 5 operational HART Incident Response Units (with 7 more to be planned until 2011) which are trained and equipped to work within a ‘warm zone’ environment, in order to provide decontamination to casualties and emergency services workers under medical supervision.

4.1.4 The Health Advisory Team (HAT)

The HAT is a strategic group chaired by the NHS, composed of representatives from a range of organisations and specialities who are able to give co-ordinated authoritative advice on the health aspects of an incident to the police Incident Commander, the NHS and other agencies. HAT is activated through the HPA via LAS Control.

4.1.5 Science and Technical Advice Cell (STAC)

The explosion in Buncefield oil terminal in December 2005 and Andoversford chemical works a year later highlighted weaknesses in arrangements for providing co-ordinated scientific and technical advice to Police Gold Commanders and other responders in an emergency, and some uncertainty over responsibilities for the provision of such advice.
To remedy this, local responders were instructed to establish a Science and Technical Advice Cell (STAC) within the multi-agency Strategic Co-ordination Centre (SCC) in the event of an emergency where there is likely to be a requirement for co-ordinated scientific or technical advice.

The STAC will subsume the role currently undertaken by the Health Advisory Team (HAT) (also known as the Joint Health Advisory Cell) at the SCC.

The establishment of a STAC is likely to be particularly important where there may be significant wider health and environmental consequences. The STAC will bring together technical experts from those agencies involved in the response and who may provide scientific and technical advice to the Gold Commander. The purpose of the cell will be to ensure that, as far as possible, scientific or technical debate was contained within the cell so that the SCG (and others involved in the response) receive the best possible advice based on the available information in a timely, coordinated and understandable way.

4.1.6 The Health Protection Agency

The HPA is responsible for the planning and coordination in the case of any public health risk. The HPA offers flow diagrams for emergency procedure followed by list of emergency contacts as well as other PDFs on responding to suspect packages, etc.:  

The HPA also runs exercises on how to respond to an emergency in order to test and implement planned operations. Some of the relevant exercises are Exercise ‘Proteus’ (chemical response exercise); Exercise ‘Orpheus II (Activation of Major Incident Plan in response to a chemical incident). The HPA also ran a case study to test response to a chemical attack on the Tube. The exercise tested roles and responsibilities of emergency services as well as detection/identification equipment (Exercise Orisis II). Emergency services included Fire Brigade, Police, London Ambulance and NHS (University College Hospital). Measures to strengthen emergency response have included: better identification and decontamination equipment and improved information and guidance for transport staff.

The Chemical Hazards and Poisons Division, (soon to be combined with the Radiation and Protection Division, and renamed as the Centre for Radiation, Chemicals and Environmental Hazards) provides advice to UK Government Departments and Agencies on human health effects from chemicals in water, soil and waste as well as information and support to the NHS and health professionals on toxicology.
4.1.7 Primary and Acute Care Trusts

There are about 152 Primary Care Trusts (PCT) in England, each one covering a separate local area. PCTs are a very important part of the NHS (they get about 80% of the total NHS budget). PCTs decide what health services a local community needs, and they are responsible for providing them. They must ensure that there are enough services for people within their local area, and that the services are accessible. These services include:

- GPs,
- Dentists,
- Pharmacists,
- Opticians,
- NHS Direct, and
- NHS walk-in centres.

PCTs make decisions about the type of services that hospitals provide and are responsible for making sure that the quality of service is high enough. They also control funding for hospitals.

As PCTs are local organisations, they are in a good position to understand the needs of their local community. They role is to make sure that NHS organisations work effectively with local authorities, and other agencies that provide local health and social care services, so that the local community's treatment needs are met.

Acute Health Trusts (AHT) manage hospitals. Their role is to ensure that hospitals provide high-quality healthcare, and that they spend their money efficiently. They also decide on a strategy for how the hospital will develop, so that services improve.

4.1.8 Local Authorities

The Civil Contingencies Act includes the Local Authorities in the First responders category. They can draw support from all other organizations involved and specifically for London, the ‘Major Incident Procedure Manual details the roles and responsibilities of each of the emergency services and how they should coordinate with local authorities.

4.1.9 The Environment Agency

The UK Environment Agency is a non-departmental public body of the Department for Environment, Food and Rural Affairs (DEFRA) and it has several relevant responsibilities
both in the preparation stage and the response to a chemical incident. Specifically, it is the agency responsible for environmental permitting, monitoring and regulating air, water and land pollution as well as safe waste disposal.

4.1.10 Government Decontamination Services

The GDS as set out by Defra can offer free advice and guidance to support those responsible for decontamination and/or remediation following a CBRN Incident. GDS services are available on request (can be requested by Central Government, Emergency Services or Responsible Authorities who may be specified by statute or, in the case of a private body or company, may be the owner/agent of a building, location or asset).

The GDS can offer advice on:

- Remediation options (including whether or not to decontaminate and what alternative options are available);
- Capability, capacity and availability of specialist CBRN decontamination contractors in terms of decontamination of the built and open environment, infrastructure and transport.
- They may, if invited to do so, be able to offer other resources to assist in the site clearance process e.g. monitoring and sampling;
- Support (and facilitate where necessary) the contractual relationship between the Responsible Authority (or Agent) and specialist CBRN decontamination contractor(s) through a Framework where agreed terms, conditions and pricing schedules are already in place.

4.1.11 Useful links

Cabinet Office website
http://www.cabinetoffice.gov.uk

http://www.opsi.gov.uk/acts/acts2004/ukpga_20040036_en_1

Department of interior affairs

The Fire Services Website
http://www.fireservice.co.uk/usar/index.php

Government Decontamination Services website
Buncefield: A UK Case Study

Several CIEs occur in the UK every day. One of the larger scale incidents took place in 2005, the implications of which are still being addressed today. On the 11th December 2005, fuel escaped from storage at the Buncefield Oil Storage Depot (Hemel Hempstead, Hertfordshire). The fuel vaporised, forming a flammable mixture that subsequently ignited. At about 06.00, the first explosion occurred, followed by further explosions and a large fire that engulfed over 20 large storage tanks. Significant damage occurred to both commercial and residential properties in the vicinity and a large area around the site was evacuated on emergency services advice. About 2000 people were evacuated. Sections of the M1 motorway were closed. There were 43 people injured in the incident, none seriously. There were no fatalities.

The emergency services (primarily the Fire and Rescue Service and the Police) led the initial response to the incident and its immediate aftermath. The Environmental Agency (EA) worked closely with the Fire and Rescue Service, the Police, the Health Protection Agency (HPA) and the Strategic Health Authorities, including advising on the water pollution aspects of the firefighting activities. The Health and Safety Executive (HSE) during the early phase of the incident stood ready to provide advice and expertise on request in support of the emergency services and EA.

Immediately after the incident, the HSE and EA set up a joint investigation team under the leadership of the HSE. The investigation team was tasked with finding out what had happened, including the factors leading up to it and root causes. Control of the investigation was handed over by the Police to the incident team on 14 December. The fire burned for several days, destroying most of the site and emitting large clouds of black smoke into the atmosphere, dispersing over southern England and beyond. Large quantities of foam and water were used to control the fire, with risks of contaminating water courses and ground water.

Even though the response from local and national agencies was significant and no casualties and health effects were prevented, reports mentioned several lessons to be learned. Several sources referred to insufficient guidance available to primary responders on a number of critical early issues, such as how to assess the impact of the smoke plume on air quality. Coordinated communication of relevant information to the public was also deemed insufficient (Buncefield Major Incident Investigation Board, 2007)
4.2 **Polish response to chemical incidents**

The legal framework for responses to major incidents is outlined in the Act regarding emergencies published in the Official Gazette in 1999. This outlines the responsibilities for the main security services involved, mainly the State Fire Service.


4.2.1 **The National Security Bureau**

The National Security Bureau is the main unit responsible for the organization and coordination of services in case of any major incidents. The National Centre for Coordination of Rescue Operations and Civil Protection bears the responsibility and supervision over the correct functioning of the National Fire-fighting and Rescue System. Specifically, The National Centre functions as:

- the operations co-ordination centre of NFRS;
- the central point of the early warning and alarm system at national level;
- the national point for notifying threats and offering mutual assistance;
- the seat and centre for forwarding information and supporting decision-making by the Crisis Response Team of the Minister of Internal Affairs and Administration or the Interministerial Crisis Team.
- the focal point for co-ordinating international rescue and humanitarian operations and organising exercises of specialised SFS groups envisaged for participation in rescue operations abroad.

4.2.2 **The State Fire Service**

The State Fire Service plays a central emergency response role. The Chief Commandant of the State Fire Service is the central authority of the government administration responsible for the organisation of fire protection and the National Fire-fighting and Rescue System (NFRS).

There are 4 specialised rescue groups:

- 2 search and rescue groups from Nowy Sącz and Gdańsk;
- 2 chemical rescue groups from Warsaw and Katowice;
The operations conducted by the National Firefighting and Rescue System include:

- Fire-fighting;
- elimination of local threats;
- elimination of the effects of natural disasters.

Additionally, the Central Operational Resources Support consists of separated special resources of the State Fire Service, including equipment and extinguishing and neutralising agents from 16 national special equipment bases.

The Central Operational Resources Support consists of:

- 34 fire-fighting companies
- 16 special companies
- 13 flood protection companies
- school-based companies and a container base
- specialised groups for operations in the scope of: high rescue (12), chemical rescue (23), environmental rescue (4), technical rescue (6), water & diving rescue (23), medical rescue (1), search and rescue (5), including 2 for international operations.

Each district has a Local Crisis Management Centre responsible for the initial assessment of a crisis and notification of specialised services if the need arises. There has been recent transition to C3M, an integrated emergency response system.

### 4.2.3 The Police

Based on the relevant 1990 Act, the Police have the following main responsibilities:

- protection of people’s life and health and protection of property against lawless assaults which might cause damage to those goods,
- protection of public safety and order, including ensuring peace in public places and in public means of transport, road traffic and on waters allocated for common use,
- initiation and organisation of activities aimed at preventing crimes and petty offences and crime-related events, and cooperation with state authorities, local governments and social organisations in that regard,
- detection of crimes and petty offences and prosecution of perpetrators thereof,
• supervision of gmina (municipal) guards and specialised armed security forces within the scope laid down in separate provisions,

• controlling whether administrative provisions and codes of order related to public activity or binding in public places are observed,

• cooperation with Police forces from other countries and their international organisations on the basis of agreements and international treaties and separate regulations,

• gathering, processing and forwarding criminal information,

• running a database with information on the results of the analysis of deoxyribonucleic acid (DNA).

4.2.4 The National Civil Defence

The National Civil Defence has the following responsibilities:

• warning;

• evacuation;

• organisation and management of shelters;

• management of blackout measures;

• rescue;

• medical services, including first aid, and religious assistance;

• fire-fighting;

• detection and marking of dangerous areas;

• decontamination and similar protective measures;

• provision of emergency accommodation and supplies;

• emergency assistance in the restoration and maintenance of order in distressed areas;

• emergency repair of indispensable public utilities;

• emergency disposal of the dead;

• assistance in the preservation of objects essential for survival;
• complementary activities necessary to carry out any of the tasks mentioned above, including, but not limited to, planning and organization.

4.2.5 The Military Chemical Forces

The Military Chemical Forces are equipped with specialist gear and perform complex tasks related to the defence against mass destruction weapons. Their principal tasks include: detection of radioactive, biological and chemical contamination, provision of collective protection against contamination as well as contamination removal. The chemical forces subunits are capable of striking enemy forces using flame throwers and providing smoke camouflage to their own forces and objects. They also participate in natural disaster recovery tasks. In peacetime, the contamination detection system used by the chemical forces is partially applied to monitoring contamination levels countrywide. The chemical recovery system is based on two Chemical and Radiation Emergency Teams.

4.2.6 Useful links

Polish National Civil Defence website
http://www.ock.gov.pl/portal/ock

Polish National Security Bureau website
http://www.bbn.gov.pl/

Polish Police website
http://www.policja.pl/

Polish State Fire Service website
http://straz.gov.pl
One of the most recent CIE in Poland took place in August 2009 in the small town of Borne Sulinowo. On Friday the 21st, three scrap metal collectors located a large container using a metal detector and dug it out. While rolling the container in order to move it to the location where they intended to sell it they damaged it and emptied a large proportion of its contents on the ground and left it there. Two of the men suffered from severe burns and were taken to the hospital in critical condition.

Local authorities were notified about the incident and after a preliminary examination it was suspected that the 200-litre container was carrying mustard gas. The area was sealed off and guarded by police and fire services in anticipation of decontamination units. In the mean time, a twelve year old boy who was playing in the area also suffered from mustard gas burns on his legs and hands and had to be transferred to the hospital. Military CBRN units appeared two days later, got a sample of the substance and took it to the lab for a more thorough analysis. Almost a week after the actual incident the decontamination process began. The precise type of mustard gas was identified and about 70 litres which had leaked into the ground contaminating the area were removed.

Some questions were raised about the response to this CIE and specifically the delayed response of the decontamination teams. Another point of discussion raised by this incident was the confusion as to the precise roles and responsibilities of each of the agencies and organizations involved.

### 4.3 Conclusion

In conclusion, a variety of actors take part in any response to a chemical incident emergency in the UK and Poland. These actors can include the basic blue light responders (Fire, Police, Ambulance), as well as highly specialised health and security organisations. Both countries have legislation in place in order to guide the emergency response, though the legislation appears to be evolving.
5. **FOCUS GROUPS**

This section of the report presents the results of focus groups conducted with health responders in the UK and Poland, in order to determine their information needs and concerns through the course and aftermath of a chemical incident, as well as their knowledge of existing plans for responding to the event and communicating with members of the public. Health responders’ perceptions regarding public information needs and behavioural responses in relation to a chemical incident were also explored.

5.1 **Focus group design and methods**

5.1.1 **UK focus group design and methods**

Three 1-2 hour focus groups were conducted with health responders in the UK (total N=12) in February, May and June 2010. Two groups were conducted at the Strand Campus of King’s College London and the third at a hospital in the South of England. Participants were recruited through a letter of invitation, which was sent to the key institutions responsible for responding to chemical incidents, as identified in Section 4 above. The final sample included participants from the Police, Fire and Ambulance services, HART, the HPA, Hospital Emergency Planning and Local Authority Emergency Planning. In line with King’s College London ethics approval procedures (ethics approval code: REP\(WSG)/09/10-3), the anonymity of each individual participant was maintained. Participants were provided with consent forms describing their right to withdraw from the study and were provided with contact details for the researchers in case they had any further questions after they had participated in the focus groups.

Focus groups were conducted by a member of the project team. The chemical incident scenario was presented to participants using a mock newspaper article which expressed concern about the transport of chemicals in an area where a large shopping centre had just opened. The scenario progressed (through response, clean up and recovery stages) using a series of injects in the form of incident update cards, which included maps as well as written information (the scenario is described in more detail in Section 5.1.3 below). From the first inject onwards, participants were asked to provide individual written responses prior to discussion. This approach was taken because individual views and opinions are known to be influenced (become more extreme) by group discussions (Morgan, 1997), and we were interested in capturing the responses of each *individual* participant prior to discussion with
the group. Focus groups were recorded in both audio and video formats and were transcribed for analysis.

5.1.2 Polish focus groups design and methods

The overall project design was the same for Poland and the UK. Four 1-2 hour focus groups were conducted in Poland (total N=14) in February 2010. All focus groups were conducted at the Nofer Institute of Occupational Medicine in Łódź. As in the UK, participants were recruited using letters of invitation, which were sent to all institutions responsible for responding to CIEs in the city of Łódź, Warsaw, and other smaller cities in the neighbourhood. The final sample included participants from the Police, Fire Brigade and Emergency and Crisis Management centres. As with UK focus groups, the anonymity of each individual participant was maintained. Participants were provided with consent forms describing their right to withdraw from the study and were provided with contact details for the researchers in case they had any further questions after they had participated in the focus groups. Focus groups were conducted in Polish and moderated by the same member of the project team as UK focus groups. Participants were presented with the same scenario that was translated into Polish, with place names changed accordingly. Focus groups were recorded in audio and video formats, fully transcribed in Polish and then translated into English for analysis. UK and Polish focus groups were both analysed by the same researcher.

5.1.3 Chemical incident scenario

A chemical incident scenario was selected to provide a stimulus for focus group discussions. The development of an outline for the incident was informed by scenarios previously developed for emergency preparedness activities of the UK Health Protection Agency (HPA).

After a short introduction from the focus group moderator, participants were shown the first mock media inject; a front-page headline newspaper article (see Appendix 1). This first inject was designed to ‘set the scene’ for participants and acted as our Stage 1. The article described the opening of a new shopping centre (the REDD centre) in a fictional city called Bagton, and highlighted residents’ concerns regarding increased traffic congestion. It suggested these concerns had been exacerbated by the fact that the primary access road for the shopping centre was also the designated HGV transport route for chemical tankers transporting goods to and from a nearby chemical facility (ARC chemicals). After reading the
newspaper article, participants were asked to discuss their general reactions and highlight any potential organisational concerns they might have in response to this news (see Appendix 2 for full focus group discussion guide).

At Stage 2, participants were shown a map of the local area, marked up to show the shopping centre, hospital, school, train-line and water reservoir, as well as distances from ARC chemicals (3.5 miles), the city hospital (1.2 miles) and the city centre (2.4 miles). They were also shown a card with preliminary incident information, which described an incident in which an ARC chemical tanker had crashed into a fuel tanker that had just arrived at the REDD shopping centre petrol station. After reading this information, participants individually provided written responses to the question “what information do you think the public should receive at this stage?” This question was repeated at Stage 3 and Stage 4.

At Stage 3, participants were provided with a more detailed map showing the actual and predicted spread of the plume of smoke from the crash and a close up image of the incident location. They were also provided with a further incident information card, which moved the incident on by 30 minutes and informed participants that a Bronze Forward Control Point had been established, road closures had been set up and there had been approximately 85 serious casualties and fatalities on the scene.

At Stage 4, two injects were added; the first introduced the idea that this could have been a deliberate terrorist attack rather than an accident and the second introduced the additional difficulty of parents attempting to collecting their children from schools.

At Stage 5, information cards were used to introduce the recovery phase (24 hours after the incident and 1 week later respectively). All incident cards appear in Appendix 3. Following this stage, participants were asked about the extent to which they felt prepared to respond to this type of incident and also the extent to which they felt the public would be prepared for this type of incident.

5.1.4 Focus group analysis

All focus group discussions were recorded in both audio and visual form and were later transcribed. Focus group transcripts were analysed using thematic analysis (as described by Aronson, 1994; Boyatzis, 1998; Braun & Clarke, 2006). Thematic analysis is a method for identifying, analysing and reporting themes across a data set. Whilst the analysis of qualitative material is necessarily a subjective process, thematic analysis is a rigorous procedure that allows the formalisation of research that can provide an analysis that goes beyond intuition (Attride-Stirling, 2001).
The development of the coding frame was assisted by the use of NVivo qualitative data analysis software, which allows data to be organised and linked in a way that encourages in depth exploration and rigorous analysis (Bazeley, 2007). The facility that computer-assisted qualitative data analysis software (CAQDAS) has to deal with large quantities of data and the way it allows text units to easily be coded in multiple categories means it can provide an extremely efficient approach to developing a detailed and flexible coding scheme (Bringer, Johnson and Brackenridge, 2004).

5.2 UK Focus group results

5.2.1 The emergency response

At Stage 1, participants expressed some concern about the proximity of the chemical plant to the shopping centre and suggested that chemical tankers driving past the shopping centre could potentially pose problems:

“Container lorries of chemicals driving straight past a packed shopping centre are never a great idea to be honest. I think we can all see where this is going” (GP1, R2)

It was also suggested that with any chemical plant there would be the potential for low-grade pollution over a long period of time, as well as for a significant one-off event. However, participants were generally confident that potential difficulties would have been considered during the planning application process, that both the chemical plant and the shopping centre would have emergency plans in place, and that shopping centre plans would take into account the proximity of the chemical plant:

“As part of the process of the shopping centre there will be, it would be part of a multi-agency group made up out of emergency services and the local authority to work with these people to ensure that they have an effective emergency evacuation plan in place for anything that would occur for them. Obviously they would have to have compliance with various regulations around fire, safety, and whatever else, and health and safety at work and all those things around the plant. And various agencies would be responsible for ensuring that they were in place before the shopping centre opened” (GP2, R2)

“So, for the local shopping centre, we’ve obviously gone through the planning process. It’s been built, it’s going to open, so it’s all set within that planning process around multi-exit planning for that site. They would take into consideration ARC chemicals” (GP2, R3)

Participants also indicated that both the shopping centre and chemical plant would be responsible for anticipating and taking action to avoid potential transport problems. For example, the shopping centre would fund traffic management schemes and the chemical plant would re-route tankers away from residential areas if required. At this stage, it was
suggested that the key authorities who would be involved in emergency planning would be Local Authorities and the Health & Safety Executive.

At Stage 2, participants described the emergency response as follows: The fire and police services would be working together to implement a cordon and set up an evacuation. The ambulance services would require more information about the incident from the fire service before they would send staff in or would send a HART team if available. The local hospital would be alerted by ambulance control to expect casualties, assuming the hospital itself did not need to be evacuated.

There was also some discussion at this stage about setting up Silver and Gold level joint emergency services command. It was recognised that a strategic response would take some time to implement, but there was a general sense that there are well-developed procedures in place and that the emergency services are well-equipped to respond to this type of incident:

“I think that you would have the initial, and I’m going to use this word very guardedly, disorganised response, but it is organised, but it doesn’t appear to be, and that is exactly what R7 was saying, and what everybody else was saying, and that is you set up your little cordons in your immediate vicinity, you would stop people from going in, and you would encourage people to go out, but there would be a second phase response which would be much larger and that would come from a Silver command, multi-agency Silver command that would be looking at the incident more strategically... And that whole thing would be going through a series of clear, distinct phases as the size and scale of the incident unfolded” (GP1, R3)

Most participants proceeded on the assumption that it was a Hazchem accident, although a small minority raised the possibility that it could be a terrorist event:

“There’s also going to be a secondary here, because a tanker on a petrol garage and this lorry’s come in and hit it and it’s actually in the petrol garage, very strange. So I think you have to be considering is this something that’s going to happen somewhere else, so there could be a secondary at some point” (GR1, R4)

At Stage 3, there was continued focus on public safety and discussion around whether it would be possible to evacuate the school and/or local residents and what to do about the people in the REDD centre. The school was considered a priority for evacuation, as it was generally considered impractical to try to evacuate all local residents:

“In terms of evacuation, at the moment it’s nowhere near that school and there will probably be a prioritised evacuation of that school or something like that, but that would have to be managed against everybody else, the people living in the houses around that school will still be being told to stay in” (GR2, R3)

“You evacuate the school, that’s a given, you just evacuate the school. You can’t evacuate all the housing, that’s impossible. A train line, you’ve got to stop the track. Roads, the main roads through, you’ve got to close the roads. Clearly you’ve got to
deal with the incident at hand but that’s an entire sector of your response. And then the biggest concern outside that then is about the REDD Centre, how many people are in there, are they affected, have you established communications with the REDD Centre management, with the security in there and find out what’s happening” (GR1, R3)

There was also discussion around the possibility of evacuating the local hospital. It was suggested that the police would take the lead on evacuation plans, but school and hospital management would ultimately take the decision on whether to go ahead:

“The police could advise the hospital that they are in the danger area. The police can advise the school that it is in the danger area and give advice but they have no legal priority enforcement. For the hospital it would be up to the hospital administration to decide what to do. For the train line the police can advise the train operators, in fact Network Rail, to stop operations, and they would – and they’re very good at doing so. The hospital is a more complicated one. There’s some very technical aspects to evacuation of hospitals, even if it’s just that little part of it. Fingers crossed it’s the administration block and not people having operations” (GR2, R1)

At Stage 4a, participants expected that the possibility it was a terrorist attack would have some impact on the police response, for example the area would now be a crime scene and investigations into possible secondary devices would be taking place:

“I’m not sure that is information I would put into the public domain, but clearly all the responding agencies, which are intelligence led, will need to set up appropriate containment procedures both at the incident scene but it looks as though it may well be that other risk assessment will have to be done about what are other probable targets etc. etc.” (GR3, R1)

However the immediate emergency response was expected to remain largely unaltered, with continued focus on the safety of the public:

“So ‘does this mean that your investigation into the incident is different?’ and the answer is no because this is still a public safety issue, there will be a significant investigation in any circumstance, whatever the cause, and so we will continue to gather information” (GR1, R7)

At Stage 4b, discussion focused on how the situation with distressed parents would be handled, in particular whether the school would be evacuated, and if so what arrangements would be made for reuniting parents with their children. Again the police were described as playing the primary role in this process:

“I think in terms of the schools it would be a police issue, in terms of how the schools are evacuated, and it’s an issue that we’ve often thought about here because this hospital is surrounded by schools and the egress and access to the site is very much dependent on traffic flow, so I think that’s going to have to be very actively managed. I must admit my instinct would be to make use of public transport facilities to bus the kids out and sort out the repatriation as opposed to getting parents to them. So I think that would need to be very actively managed” (GR3, R1)
There was also some discussion about the possible impact of mass casualties, including storage and dealing with relatives who want to reclaim bodies. It was also suggested that depending on the nature of the incident (i.e. if people were trapped in the wreckage) that Urban Search and Rescue (USAR) may also need to become involved.

At Stage 5, discussion about the emergency response focused on the Casualty Bureau and the potential police investigation. There was some discussion about procedures for dealing with casualties – described as less complicated due to chlorine being a 'clean' chemical (i.e. it was perceived as unlikely to cause long term contamination) - and the complexities of returning mass casualties to their relatives:

“I think the public, I think the relatives will still be expecting a greater access to their, to the deceased but at the end of the day if it’s a deliberate act, it’s a crime scene and the releasing and the management of bodies, from, all of whom have been effectively murdered, will require significant management and significant public communications issues. That will require management” (GR1, R7)

There was also some discussion about controlling the cordoned area if this was now a crime scene, particularly in the light of expected pressure from the REDD centre to be able to open for business again:

“There’s going to be immediate pressure from the commercial sector to recover that [the REDD centre] and they’ll be all over you as far as the insurance companies looking to assess the level of damage. So controlling that and the cordon for quite some considerable time is going to be of major interest to, certainly the police and certainly to the fire, to the police criminal investigation, whether it’s criminal or accident investigation, and to the Fire Service who will be handing over the safety of the scene and so on, when it can” (GR1, R3)

It was suggested that once the forensics had been recovered, the scene would be handed back to Local Authorities to implement a recovery plan. At this stage, Local Authorities would be organising meetings with local business and community members to facilitate community and business recovery:

“Local Authorities at this stage would have a huge, I was going to say a greater involvement, but more emphasis on Local Authorities to take the lead in providing information, so that may be in the form of meetings with all of the businesses concerned in the shopping centre, or a meeting, probably facilitated by the shopping centre but with local authority support and other emergency services and HPA... with maybe the students or parents concerned, maybe one for local residents” (GR2, R3)

At the end of the scenario, participants were asked about their capability for responding to this type of event and responses were generally positive:

“I think the reassuring point is that we are better equipped now than we have been for a very long time and I’m not just talking about CBRN because that’s my business if you like, but I think the emergency services are better equipped now to deal with this type of incident than they have been and it’s a progressive thing. Now the
question I suppose you have to ask is, are we only as well prepared as we are for the previous, for the last disaster? You know, we learnt a lot from Buncefield, are we better prepared to deal with a Buncefield? What is the next disaster and will be properly prepared to deal with that? So that's the only caveat I'd put, but we are better equipped now to deal with these things than we ever have been before. Have we got issues over funding, have we got issues over training, have we got issues over quality of staff we employ – yeah of course, absolutely, absolutely we have all those issues and so, but I think the bottom line is we're better equipped now than we have been for a long time” (GR 1, R7)

5.2.2 Health responders’ information needs

Other than a very brief comment in one focus group that it would be useful to know the number of chemical tankers using the roads near the shopping centre, there was no discussion of information needs for health responders at Stage 1. Once the incident was introduced at Stage 2, their information needs focused on two key areas: 1) expert off-site technical advice and 2) practical information identified at the scene of the incident. Technical information needs centred on the nature and spread of the plume and information about chlorine, including how it would interact should it come into contact with other chemicals:

“Probably one of the most important and first things you need to do would be to get some meteorological information so that you can do some T modelling so you could have a look at how many properties or businesses or the REDD Centre or wherever else is going to be seriously affected” (GR1, R3)

“Also from a Fire Service point of view, you need to know what’s in and around that area, other processing plants etc with a mixture of substances impinging on that process” (GR 1, R5)

Practical information needs focused on access routes, personal protective equipment (PPE) requirements and the nature of casualties.

“The second point is I would sincerely hope that whichever agency first arrives, you’ll find something like SAD CHALETS12 which is a pneumonic which I won’t embarrass myself by trying to repeat, but essentially a pneumonic which actually guarantees that the first responding agency starts to assess the situation and deliver the right information back to the further responding agencies, which is things about the size of the problem, the nature of the casualties, access routes in etc. etc. Locations, application, evacuation points, all sorts of things, emergencies present and anticipated, and the issues present and anticipated” (GR1, R3)

Participants also wanted to know whether they should be advising the public to ‘stay in, turn on and tune in’ or evacuate:

“Obviously we need to know what the health problems of chlorine are... do we need to evacuate, or to stay in, turn on and tune in? The approach to the incident from first

12 SAD CHALETS approach: ‘Survey, Assess, Disseminate, Casualties / Hazards, Access, Location, Emergency services, Type, Start log’
responders and the level of PPE they would be required to wear, would it be full gas-type suits, the Fire Service, the RPS or an ambulance to deal with the initial casualties” (GR1, R3)

Key sources for technical information were the Health Protection Agency (HPA) Chemical Hazards and Poisons Division (CHapD), a Science and Technical Advice Cell STAC and the strategic command centre. As described above, it was suggested that practical information should be disseminated by the first responders on the scene, using a SAD CHALETS approach.

At Stage 3, responders’ information needs continued to focus on scientific advice about the plume and further information about the cause of injuries and casualties:

“Going back to the first problem is where we got 85 plus fatalities, injuries whatever, the thing is if we went in there and checked out, now did these people die from the explosion or did they die, did they show some other signs and symptoms? Immediately those dead people or injured people can give you another good clue to what’s actually going on, so ‘cause you said there was an explosion, it could be that the whole bloody windows have blown in and everybody’s been killed or hurt, and they might not have any breathing problems whatsoever. So I think that’s quite important” (GR1, R4)

At this stage responders also wanted to know more detailed information about the incident, for example, how many people were in the REDD centre and what critical infrastructure had been affected. They also wanted further practical advice, for example, the local hospital would need to know whether to evacuate:

“The other key bit of information in terms of the public, people working in the hospital are clearly going to need advice in terms of risk stratification – do they stay in play or does the hospital need to trigger let’s say an evacuation plan” (GR3, R1)

Information sources were generally the same as at Stage 2, for example, Local Authorities would be looking for information from Fire Service scientific advisors, as well as the HPA and possibly a STAC. The importance of getting consistent scientific guidance and advice across agencies was emphasised:

“The most important thing in this is, I would say, is assessing the scene, and the advice that you receive and the support of the operations people assessing the scene, so that advice whether it’s... HPA, Chemical Poisons division, whoever, the value of that advice and guidance cannot be understated, and the consistency of that advice and guidance and for all agencies to be able to go to the same agency or the same people and get the same answer is actually really, really fundamental as a commander on the ground. There is nothing worse than, what to describe it as, the egos of different scientific elements [laughter] getting in the way of operational expedience, and there is that danger all the time. I mean basically, I can’t speak for my operational colleagues but that’s the type of thing you face consistently, so effective scene assessment is dependent upon, in this type of scenario, good advice” (GR 1, R7)
At Stage 4a, the chemical company were considered a key source of information for the investigation into intent, as they could provide information about the driver and whether any of their vehicles were missing or stolen:

“We’ve already got liaison with ARC, the chemical company. They can tell us if one of these vehicles is reported missing, stolen, who the driver was, what the schedule was, whether he’s got health conditions, and all those sort of things are going on in the background” (GR 1, R5)

At Stage 4b, there was little additional discussion of responders’ information needs, although hospital responders indicated they would need advice as to whether they should declare their own major incident, as well as information about how long the incident would be likely to last:

“I think the hospital is going to be very dependent on it receiving, the hospital needs to effectively declare its own internal major incident, it would have to be, the hospital site would have to managed as a major incident site and have to set up its command structures and set up its own Silver effectively, through the hospital information team, and that central team is going to require very specific advice about immediate actions” (GR 3, R1)

Hospital responders also suggested it would be useful for the hospital to provide advice for staff with children or other relatives who might be involved in the incident, with a view to minimising potential absenteeism:

“It’s a huge area of risk for all organisations. We went through this with, when facing a pandemic, where a very high percentage of hospital staff will either have adults or children who are dependent on them, so it has a greater direct impact on potential absenteeism or people just upping sticks and, or downing tools rather. So I think the hospital’s going to need to give out the red, it’s going to need to have communication systems in place to be able to get common sense advice out to its staff very quickly” (G3, R1)

At Stage 5, health responders’ information needs focused on the need for scientific advice about the environmental impact of chlorine and information about what needs to be done for long term recovery:

“I would also have some concerns about where’s the chlorine gone? Has the chlorine disappeared into drains and other things like that that will then suddenly reappear somewhere else. We’ll need to look at purging systems and things like that” (GR2, R2)

5.2.3 Expected public response

At Stage 1, some participants anticipated the potential for environmental protests in response to both the chemical plant and the opening of the shopping centre. It was also suggested that the public would report any traffic violations should chemical tankers use roads they had been instructed by Local Authorities to avoid:
“I think residents in an area are very good at picking up on and they take their own action, from experience, they’ll start recording registration numbers, they’ll take pictures of the vehicles if they’re coming through areas where they shouldn’t be, and then they’ll report that back through the parish council or whatever, whatever process, back to the local authority who can then, who’ve got evidence to take some action” (GR2, R2)

At Stage 2, the public in the immediate area were expected to panic in response to the news:

“Camera crews wouldn’t take them long to get there, so it’ll be on television within minutes and people around them will be starting to panic” (GR1, R4)

It was suggested that if the public assumed this was a terrorist incident this would enhance the likelihood of a non-optimal public response:

“It’s possible people could respond to this immediately as a terrorist incident rather than an accident and that brings in its own complications” (GR2, R1)

However, there was also an expectation of public compliance to instructions provided by uniformed officers from the emergency services:

“I think quite generally in any incidents like that they see a uniform and they sort of feel a bit better, ‘I feel safe’ and you’ve just got to say something to most of them and they’ll just do as you tell them” (GR1, R4)

“Specifics, never give out specifics anyway, everything becomes a generality, you know, you’re the team, or the first responder or whoever that is in a situation like that and people are coming to you with questions, you never give them specifics. It’s always, ‘Oh there is an incident. Can’t really tell you what it is. You need to keep on going the way you’re going. Just keep moving along and someone will talk to you in a minute.’ Just keep people moving, and they tend to do it, they don’t tend to get into the specifics with you” (GR 1, R2)

At Stage 3 there was further discussion about the potential for a panic response from the public. There was also some discussion about the ‘worried well’ (introduced by the moderator) and hospital responders felt it was likely that some individuals would unnecessarily present at local hospitals:

“At least 5:1, I think it’s around 5:1 if not 10:1 worried well to contaminated. There is real potential for panic” (GR 3, R1)

It was suggested that the public in the immediate area would be scared, regardless of whether the plume contained dangerous chemicals:

“And actually even though I mentioned earlier the dilution factor in that plume, that will be irrelevant because it doesn’t matter how diluted it is. If you say, ‘Well actually it’s really diluted by the time it gets down there. We can shut them in and those kids will be safe’, actually it’s probably not enough because the parents will still go to the school” (GR 1, R7)
Individuals outside the immediate area were also expected to require reassurance about their personal safety:

“Also we are focussing on the yellow area at the moment and people outside the yellow area are interested for all sorts of reasons, either just because they’re curious or they may have relatives within that area or because they planned to travel through there on the way home. So they’ll be instantly asking questions. Or of course also the city centre being not very far away, people will be saying, ‘Are we safe in the city centre?’ So there needs to be some form of reassurance for them” (GR2, R1)

At this stage, there was continued discussion around the possibility that the public may not behave optimally. For example, it was assumed that parents would want to collect children from schools, even if advised against this action:

“If you don’t evacuate the school, all the parents from all the way around are going to go to the school and get their kids. It doesn’t matter what you say, they will go to the school” (GR 1, R7)

The need to anticipate and control the behaviour of individuals inside the REDD centre was also emphasised:

“Because in a centre like the REDD Centre there would be Sony shops, Panasonic shops, and the people would actually be going to those to have a look to see what’s on television and to see how they’re affected by the incident. Now what is their reaction? Do they look at that and think, ‘I’m out of here’ or do they look at that and think, ‘I’m staying here, ‘cause that incident’s outside.’ There’s a lot of human behaviour stuff involved with this and that is one of the things that the emergency services are going to have to a) try and anticipate and b) try and control” (GR1, R3)

At Stage 4a, there was some discussion around the possibility that the public may now be looking to apportion blame, for example, by criticising the Local Authority for providing planning permission. The situation was now described by Local Authority responders as moving from an actual to a political emergency:

“I think also at this stage we would be getting into the man-hunt side of the process in that we are concerned with what the public need to know in terms of their safety but we’re going to have to also start a bit of reputation management for the city as a whole because there will be residents saying, ‘Oh, I told them that they shouldn’t be building this site,’ or ‘we’ve always had problems with this. It’s the fault of so-and-so.’ So it’s becoming a political emergency as much as anything” (GR 2, R1)

At Stage 4b, discussion about public responses focused on the perception that parents would be worried, and the expectation of non-compliant behaviour from parents was reiterated:

“Any parents making themselves known or presenting themselves to the inner cordon or the outer cordon should really be escorted to a single point of contact so that they can be gathered together to be reunited with their children at the earliest opportunity. Now what we don’t want, obviously, is for the parents to be allowed into those areas to pick them up from the schools independently from any coordinated action that we’ve got. Whether that is 100% achievable is always the issue, isn’t it? And it often
isn’t 100% achievable because a parent will find his or her way in if he or she wants to, and one way or the other, but as long as you can have an organised plan, that reduces that likelihood to a minimum and we’re doing all we can to reduce the impact of anybody actually going into the area” (GR1, R3)

It was also suggested that parents would be unlikely to know the emergency procedures for their children’s schools in advance:

“Interestingly with parents, and I am a parent and I’m actually trying to work with my children’s school on their emergency plan, parents as a rule do not know what schools do in an emergency, so they don’t know that their children will be taken to a safe place, that they’ll always be looked after till six o’clock. They don’t have that pre-knowledge” (GR2, R1)

Concern about lack of behavioural compliance extended beyond parents, for example, as discussed in 5.2.2 above, hospital responders expressed concern about the potential impact of this type of incident on absenteeism of hospital staff.

At Stage 5, there was further discussion about the likelihood of the public looking to apportion blame after an event of this type. It was suggested that MPs would also be asking questions on behalf of their constituents and it was assumed there would be reduced public trust in the chemical company:

“The other thing I was going to say talking about the public, of course we’ve got all these elected members who represent the public are also on our back, who want to know what’s going on and want to know it now – ‘What do you mean you don’t know?’ They’ll come banging on your door. Could be running a major incident and they turn up” (GR 2, R2)

“Or ARC Chemicals. There probably wouldn’t be a great deal of public confidence in them” (GR2, R3)

However, the assumption of public trust in uniformed responders, including both the police and the fire service, persisted:

“And it was touched on when we very first started this workshop, was that once they see a uniform coming towards them, that’s all they’re concerned about. They don’t want to know the background or how to deal with it themselves, they want to know that there’s people in place that will deal with it for them” (GR1, R5)

“So whereas in other countries across Europe the police services are almost closer to that paramilitary position, the police service is different in this country and this is why there is that acceptance that a uniform is going to help you. It would be natural for you guys anyway but the police service is seen as a helping organisation” (GR1, R7)

“The fire service in this country is, the fire service has a reputation as being completely impartial, and it doesn’t matter who you are, our first response is to your care and to deal with the emergency that we’ve got” (GR1, R3)
At the end of the scenario participants were asked about their perceptions regarding public preparedness. The majority indicated that they did not think the public would be particularly well prepared. For example, Local Authority responders described the results of a survey that had been conducted in their local borough, indicating a lack of public preparedness for emergencies. Others highlighted perceived difficulties in dealing with this issue, arguing that the public are not interested in pre-event information and are not aware of information that is already published on official websites:

“You can put as much information as you want out there but you can’t lead a horse to water. Because if people don’t want to read up on it, they won’t read up on it” (GR1, R5)

5.2.4 Existing public communication strategies

There was little discussion regarding the provision of information to the public at Stage 1, although the Local Authority responders briefly discussed the fact that the public in the immediate vicinity of the chemical plant would be provided with some information and that this ‘information zone’ had recently increased:

“An interesting complication in this process is that some of the hazard areas, or the areas which are used to define where information should go to the public from this sort of chemical site are being changed, so we had one in [London Borough] where the distance from the public information zone has been changed. It would be very interesting with this if there were any change in the hazard area, whether the shopping centre came within that, and eventually people’s concerns would change because a wider group of people would have been told about the hazard. Again coming back to [London Borough], the public information zone for our site at [specific venue] has just been changed... I’d be interested to see how that’s going to work in terms of the relationship with the public, because more people will get the letter through the post than they would have in the past” (G2, R1)

At Stage 2, the primary aim of information provision for the general public was to let people in the immediate vicinity know what they should do. There was a very consistent message that local residents should either be told to ‘go in, stay in, tune in’ or they should be told to evacuate. This appeared not only in discussion, but also in a large majority of written responses to the question ‘What information do you think the public should receive at this stage?’ For example:

“Whether to evacuate or stay inside with windows/doors closed, air conditioning turned off etc” (GR1, R2, written response)

“Advice on what people should do – e.g. go in, stay in, tune in, avoid area” (GR2, R3, written response)

As well as telling the public what they should do, the importance of providing information about what the public should not do was also emphasised. This included discouraging those
outside the immediate vicinity from entering the area, as well as asking the public to avoid tying up the mobile and/or emergency phone networks and presenting to A&E:

“So I think the first thing, we’d have to probably through the media to say people either stay in their houses, or they’re not to leave or whether they should go or shouldn’t go, and not use mobile phones because you’ll block other people’s communications but also give them a helpline number, right at the beginning, ‘cause they might be panicking about people in the Centre or whatever. So that would be my first thoughts, but you’d have to give them information like that” (GR1, R4)

“If concerned about relatives, do not ring 999 – contact local call centre for advice” (GR 1, R6, written response)

At this stage, another key goal of information provision was described as reassuring the public that the emergency services are responding appropriately:

“You need to give direction relating to safety, that’s the paramount information, and that delivery of information which relates to safety will provide the next thing which is confidence and reassurance that the agencies are dealing with it” (GR1, R7)

“Reassurance that incident is being dealt with” (GR1, R2, written response)

The media were described as a primary source of information, both official and unofficial (media strategies are discussed in more detail in Section 5.2.5 below) and it was suggested that an emergency hotline would be set up. There was some discussion about the role of the different emergency services in communicating with the public. The police were seen as the primary source of information, both at the incident site and in providing a media spokesperson. However, there was also discussion about the importance of presenting a united message and the need for ambulance and fire spokespeople to support police communications:

“A statement would be pre-scripted, it would be, probably by a senior police officer supported by ambulance and fire officers, so that there is a face of authority and control there, so the public are reassured that the emergency services are responding to it and taking it seriously” (GR1, R3)

“The vision of all three agencies being joined in the delivery of that information is actually, that is fundamental, and the various media departments in each of the three agencies are again well practiced, well used to working together, and they would be in contact with each other before anybody starts to ask for that to happen, it will happen. So the media officer in the local constabulary will be talking to the media officer in the fire service and the ambulance service and they’ll be starting to formulate a media plan and a media strategy. It’s almost a given” (GR1, R7)

One participant suggested that there is some lack of clarity about whose responsibility it would be to release the initial message (i.e. the fire brigade or the police) and suggested that the fire brigade sometimes take the lead if they have primacy at the site:

“I don’t think we’ve decided this properly yet in London, is who will decide and release the message? ...Because of the timeframe, it’s very early, within part of an
hour, you can only really expect those messages to come from emergency services at the scene… I’m not talking the talking head, I’m saying who is going to release this message? Is it a fire Brigade message saying we advise the public to do something, or the police? It hasn’t quite been decided yet” (GR2, R1)

At Stage 3, the key focus of public communication messages was continued safety advice and it was emphasised that advice should be simple and practical:

“I think the advice should be simple and practical, focusing on stay in and tune in, etc, but it’s going to be particularly important but could also be linked to whether or not they should shower or wash themselves off, emphasising the importance of follow-up and where to seek medical advice and specifically when they can expect further updates in terms of, as the picture evolves” (GR3, R1)

Again there was continued emphasis on the need for public communications to provide reassurance, for example, use of the EAR approach – Empathy, Action, Reassurance. However, one participant also highlighted the need for caution when providing reassurance about relatives:

“The Casualty Bureau is doing exactly what R3’s saying, it’s taking, it’s a repository of information and decisions about when to announce how many people have died, you know, so many times in the past that information has been given out and it’s been given out incorrectly. You just learn that you just don’t do that now. And you don’t give people assurances that people are OK. You just take the information, you give them a standard message back and then you collate and then you ask them and you say, ‘If this person turns up and you know they’re safe and well, could you please let us know?’” (GR 1, R7)

As the incident progressed, it was suggested that more specific and targeted, although not necessarily more detailed, information would be released to the public, for example, about the substance and possible health effects:

“So we need to start giving specific, more targeted information about the incident. The public would expect regular progress in the news bulletins as they progress in time, so as the incident evolves, so the reactions and the response is evolving. And then reassurance about what we are doing and in terms of making sure that the larger picture is being resolved” (GR1, R3)

“More specific information re: substance and possible effects” (FG1, R5, written response)

Some participants spontaneously mentioned the need to have a communication strategy for parents of school children in the area:

“I suspect that bearing in mind that there’s a school in this area, I think there’s going to need to be some public information strategy around the management of the children in terms of collecting them or not etc. And reassurance” (GR3, R1)

At this stage the media were still considered a key source of information for the public, but now GPs and local authorities were also described as likely sources of public information. Several participants also emphasised the role that the internet would be likely to play, both in
terms of the importance of providing official information in this format, but also as a general source of information for the public:

“I think the other side of things is bearing in mind we’re living increasingly in an information-rich positive society, I think publishing the information advice and signposting that electronically can I think go a long way to feeding the beast” (GR3, R1)

It was suggested that it might be useful to set up multiple hotlines, targeted at people in the vicinity, those with relatives who might be affected, the school evacuation and general health concerns. It was thought that the chemical company would be inundated with calls and may therefore also set up an information hotline:

“You would and ARC would be making announcements of hotlines...They’re going to be inundated with calls as well, so they would be part of that whole information exchange. And you’ll be providing them with advice as to what they should and should not be saying” (GR1, R3)

At this stage, responders in Focus Group 3 highlighted the importance of finding a credible source of information to effectively communicate levels of risk:

**R1:** I think going back to how do you achieve the balance, I think you’ve got to give the public sufficient information to enable them to form a view on that, but at the same time I think we need the professionals to quantify or to find out more about the risk using language that people understand. So if at the end of the day the risk, the hazard, is low or small, then I think that’s the sort of language that I think needs to be used, and I think it needs to come from authorities that are credible.

**R2:** And that’s a really important message that has happened time and again from these type of things, is that people have got to believe where it’s coming from and in fact doctors seem to be quite good at providing that level of reassurance, or that’s what I’ve read from some studies I’ve seen.

**R3:** But what is absolutely vital is that the, this message obviously has to be coordinated and it is vital that as the media strategy is developed that there is appropriate high-level scientific input as such strategies develop.

At Stage 4a, the primary communication aim continued to be the provision of information about what do to and where people should go for further information. Consistency and reassurance continued to feature prominently in discussion, as well as the need to update information as required:

“If any of the previous info has changed this will be given. Also any evacuation areas set up since last report” (FG1, R6, written response)

“Confirmed update on plume spread” (GR2, R3, written response)

The majority of participants suggested there would be no change in the information provided to the public in response to the media speculation about intent:
“And the statement that we’d made earlier would still be the statement we’d need by now, because quite simply we are talking to all those that witnessed the incident and we are considering what might be the cause of this situation, and we will keep you fully informed of our considerations in that respect. I don’t think we would, we certainly wouldn’t stand there and say, ‘This is a terrorism’” (GR1, R7)

However, several participants indicated in their written responses that they would acknowledge this speculation:

“Statement about possible terrorist link or not” (GR 2, R3, written response)

“Information about intent will need to be acknowledged as media + twitter would already be aware, but doubt can be expressed” (GR3, R2, written response)

At this stage, the need to communicate the strategy for longer term recovery to the public was introduced:

“Start to provide information on longer term recovery” (GR1, R3, written response)

It was also suggested that positive actions that had been taken should be highlighted and that some ‘reputation management’ may be required if the public do start to look to apportion blame:

“Probably a need for reassurance + “reputation”” (GR2, R2, written response)

Interestingly, despite the prevailing view that public messages need to be kept simple, one written response suggested that “the public can take in and accept quite complex messages” and argued that the public would need information to help them to make their own decisions.

There were no significant changes to information sources at this stage, although there was more discussion about the use of NHS direct for provision of health related information, and it was suggested that anyone with concerns about missing relatives would be directed to the Casualty bureau for information. It was also suggested that all agencies receiving calls should be directing the public to the same source of information (NHS Direct or a designated hotline), again emphasising the need for consistent public communication messages:

“Hopefully the Local Authority and all other agencies we could expect to receive calls would be given the same line to take and would be directing people to the same places, so local authorities might field calls about certain issues but anybody with health concerns will be re-directed to NHS Direct, anybody with concerns about missing relatives or similar to the casualty bureau. Maybe there’s a separate helpline for people who have concerns about school children” (GR2, R3)

At Stage 4b, there was a continued focus on the need to provide reassurance and targeted, specific information about health and transport. The need to communicate about long term recovery, including community impact as well as direct impact, was also a continued theme:
“I’d provide public information on, really important this, on the transport infrastructure and how that’s affected, because that’s really what’s going to cause most of the chaos in the area, and then start to provide information on the longer-term recovery. So it’s not just about action and response, it’s telling them that you’re moving into a recovery phase as well... it’s very important that the public know that you’re moving towards recovery and the community impact as well as direct impact” (GR1, R3)

There was some discussion about the need to provide information for parents of school children in the affected area, as well as guidance to the schools and it was suggested that this information may be provided via a hotline or via schools directly contacting parents:

“And that’s where command decisions are made, if somebody says, ‘No, you haven’t got time to evacuate the school’ then you don’t evacuate. You contact the school, we get them to lock down the school, give them advice and guidance in respect of respiratory protection, whatever that is, you know, getting kitchen towels out or whatever, and then inform, then you need to get that public information about people not going into the area” (GR1, R7)

“The affected school I think we as a local authority will try to help them as best as possible with contacting parents, but we may have no access to information, it depends on the status of the school. We don’t necessarily know who the parents are or anything like that. The school holds all that information. The school is able to trigger things. With regard to the other schools who are unaffected, as part of that message of confidence, schools will be held open to look after children. Do not worry. But parents will worry” (GR2, R1)

It was also suggested that once the technology is developed, it would be very useful to have a mass text-messaging service that could send a text to all mobile phones in the affected area.

“The real win, if we could ever do it, would be the cell-based mass messaging system where you can identify phone cells and just send a text message to everybody’s mobile phone in that area” (GR2, R2)

This group also returned to discussion about informing the public in the immediate vicinity and suggested that this might involve public information systems in the shopping centre or loud hailers on emergency vehicles:

“I think people within the red area, assuming it was working, would be loud speaker system, public information system within the shopping area. Outside of that, police cars and, although there are limitations in their effectiveness, the loudspeakers on police cars, fire engines and ambulances” (GR2, R1)

They also emphasised the need for more clarity in terms of whose role it is to disseminate information to local residents and to the local hospital:

“But outside of that area [the red zone] how are we going to get information to the hospital? Well, a telephone call from somebody. Who is that somebody? To the hospital. From the school I would expect the information to come through to us as the local authority, and we’ll pass it to the school, although it may go in the form of a visit by a police officer. For the other people living in the area, I’m not so sure. We need to
think about that and there needs to be a decision-making process at the scene as to how that information is going to be distributed” (GR 2, R1)

At Stage 5, there was more focus on post-event information, in particular health information, both for those who had been exposed to the chemical and for the ‘worried well’:

“One of the things we’ve worked hard on locally is an agreement that if there’s any heads up that there could be a chemical incident or people could self-present, that even before the incident is fully assessed that the receiving hospitals are alerted early so that they can be locked down and the police will prioritise receiving hospitals as becoming important protected sites. So this is one of the areas that is important. So consistency of advice is going to be critical to all this. Sorry, the other area is follow-up, follow-up advice. There will be some people that may have inhaled something that smells a bit funny and may, if it’s a carcinogen, they may need for public follow-up, they may need screening and all the rest of it, so I think we need to give a very clear public message around that and how and where people should access that, so that presumably would require extraordinary arrangements to be set up to provide that type of screening and support. So that’s going to be clearly a very important public health.” (GR3, R1)

It was suggested that information may be provided about intent once control was gained over the incident and that by this stage it would be likely that the public would be provided with information about the perpetrator:

“So by then we would know the name of the tanker driver, we’d know his history or her history, we’d know whether they had any ideological or was this just lone wolf or whatever. And to be perfectly honest, we would be, at 24-hours we would be giving that type of information. We would be saying, in the same way with 7/7 there were statements within that sort of length of time which were basically saying it’s a terrorist attack, this is the nature of it, these are the nature of the individuals involved. So I think at 24 hours we would be happy that we would be giving that information out” (GR1, R7)

The media, NHS Direct, the Casualty Bureau and the emergency services continued to be described as key sources of information for the public at this stage, and it was suggested that the NHS direct could play a key role in minimising the impact of the ‘worried well’. However one hospital responder expressed some concerns about the efficiency of the NHS in providing public messages:

“But if we look back to our experience with flu, and I know that’s a different type of incident, at one stage at the beginning with flu there was a little bit of confusion between NHS and HPA as to what should be being said. We were slightly stuck in the middle and in fact our experience was that the NHS were quite slow at approving words even to go on simple things like a website” (GR2, R1)

During the final discussion about preparedness, there was a general sense that inter-agency communication is improving:

“I think it’s improving all the time. I mean the emergency services are moving towards common communication platforms and for an incident like this, what would be the automatic you know. Silver would be set up and the threshold for setting up Gold for
an incident like this is going to be very small, and the emergency services, those are things that they do practice and train for” (GR 3, R1)

However, one group did criticise the fire services for not wanting to communicate with the public and another indicated that there is a lack of consensus between government departments regarding how much information should be provided to the public.

“Local Authorities, here in London, we are interested in communicating with the public. We are closer to the public than the emergency services. I think that the emergency service which has, somebody who communicates needs to be trusted. The trusted source in London from the emergency services is probably the police and the Fire Brigade. Neither of them are particularly keen on giving information to the public.” (GR 2, R1)

5.2.5 Existing media communication strategies

The media were seen as playing a primary role in the dissemination of official and unofficial information. It was assumed that the media would arrive on the scene very quickly and inform the public that an incident had occurred:

“I think the media would have done most of it already. Camera crews wouldn’t take them long to get there, so it’ll be on television within minutes” (GR1, R4)

Emergency responders were described as directly utilising the media, particularly local radio, to provide official updates to the public:

“The public in general should be told that there is an incident, to stay away from the area and to tune in to local radio, and local radio is usually the media that is used to provide official updates on an incident” (GR1, R3)

The media was described as an important and effective tool for public communications:

“Just as on 7/7 the BBC and media outlets can be very effective and actually giving other messages out to protect or ring-fence limited health services... the public were advised not to go to the emergency department unless it was an emergency or keep away from General Practitioners unless it really was very urgent and I think that that was proved to very effective” (GR3, R1)

However, there was a general perception that unless the emergency services took control or managed to develop partnerships with the media (preferably pre-event) that the media would tend to provide speculative, sensationalist information:

“Controlling the media is absolutely essential, but working in partnership with them is also essential, because if you don’t give them the information they want, they’ll go and get their own information” (GR1, R3)

Consequently there was a strong focus on the need for a coherent media policy. A key feature of discussion around this issue was the importance of having a joint media strategy across emergency services, and this was described as working very effectively in the UK:
“They [each emergency response organisation] have their own media staff and they meet and work together on a regular basis. So there would be a joint media cell within the strategic command centre, but even before that’s set up formally in the strategic command centre, the media elements in each service would be talking to each other” (GP1, R7)

A number of strategies were identified for ensuring effective communication with and through the media. Firstly, it was suggested that information should be provided as soon as possible and should be regularly updated. The need to be reliable in terms of providing promised updates was stressed:

“So regular news bulletins, regular news briefings and if you promise them that you’re going to do a bulletin or a news briefing every hour, that’s what you do” (GR1, R3)

The importance of providing truthful information was also emphasised:

“If we say to the media, ‘Right, we’ll have a briefing’ and also that that strategy has got to be a multi-agency agreed press release as well. ‘cause they’ll only come back and put their slant what they want to if we don’t give them the truth” (GR1, R5)

The role of new media and social networking was recognised. This was seen to limit the possibilities for controlling the flow of information and further underscore the importance of disseminating accurate information:

“I’m looking at this and I’m looking at the public information, and I think this has really changed over the last two or three years with Twitter and there are now so many avenues for this information to be transmitted upstream and if, in the old days you could probably hold fire for a while and not necessarily tell people anything, or while it’s got to be kept to the bare minimum the problem is that the news organisations are going to be alerted about what’s happening far more rapidly than they ever were in the past, and they’re going to have access to better people and people on the ground through using these sort of technologies, and so I think this has really forced people’s hands, or it’s going to force people’s hands and to some extent then the debate about whether you should provide information is going to be, somewhat moot because the question is really how best to provide and manage this information getting out, because the danger is that you’re going to get so much false information. We know that when these things happen you get so much information that is wrong and how do you counteract that and how do you manage that? So I think the thing is that you’ve got to be very sure that what you do put out is absolutely true. It makes it much more challenging” (GR3, R2)

There was also a perception that it was important to provide the media with access for filming where possible or to explain why access was not possible:

“And also you’ve then got to recognise that you need to give them something, you need to give, if they want footage of it, you need to get them to a place where they can get footage of it, ‘cause if you don’t they’ll, you know. And if you don’t want them to do something, you give them a reason for not doing so. ‘Don’t fly over the top with a helicopter because that makes the cloud, the potential downwind cloud even worse, and you create even more danger.’ (GR1, R7)
Given that the incident would be likely to provide good news footage and look dramatic, there was an assumption that there would be interest from the national media:

“I suspect that there are some fantastic pictures coming out of this incident so this is global news” (GR2, R1)

“The only other point I’d make is don’t underestimate the national interest that this would attract. It might appear to be a local fire, a local incident but actually very quickly, because of the news coverage, Sky would be there, and Sky’s motto is, what is it? ‘Not wrong for long’ in terms of the news they put out, and they would be there, which then would mean that government would know, government would be interested, so the important link between the local media cell and government news service would be fundamental as well. So don’t underestimate how quickly there will be higher national interest in what was going on” (GR1, R7)

In response to the suggestion there could have been terrorist involvement, there was a suggestion that the media would speculate about intent, regardless of public perceptions, but that this could be countered by good communication strategies. For example, it was suggested that effective communication strategies following the Buncefield chemical incident meant that a media terrorism theory never “got any legs”. There was a largely consensual response that it would be unhelpful to make a statement to the media to indicate that there could have been terrorist involvement in the incident:

“At this stage it doesn’t, in the emergency phase I think it’s very unhelpful, it would be very unhelpful to make a statement that would indicate that there was intent behind it. You would introduce that as you gained control of the incident and as the police started to gain control of the area, you would have intelligence and the police would be then looking for the motive as to whether it’s an isolated incident or whether it’s part of something that’s much bigger, which would give an entirely different set of responses and reactions behind the emergency response, to support anything else that might happen. At this stage there’s nothing else we can say” (GR1, R3)

“I don’t think the public won’t ask those questions. The media will though. The media will. They’ll be all over it like a rash with conspiracy theories and all sorts of things. And again that noncommittal approach is the most important thing. We’re not ruling anything in and we’re not ruling anything out will be the standard statement delivered through the media” (GR1, R7)

However, it was recognised that this speculation would increase media interest, which would in turn increase likelihood of a regional (in addition to local) response from the authorities as well as enhancing government interest in the event:

“I think that there are two factors in this. One is the eye-witness statement which may imply its terrorism and that will increase the media interest. The second thing is the size of the media interest and I suspect that will drive the beginnings of regional involvement and perhaps triggering some form of regional response” (GR2, R1)
5.2.6 Summary of UK focus group results

With regards to overall emergency response capabilities, UK focus group participants demonstrated a clear awareness of the key players/stakeholders and their responsibilities and roles, as well as established procedure. During Stage 1 participants expressed some concern about the proximity of the chemical plant to the shopping centre but were generally confident that potential difficulties would have been considered during the planning application process, that both the chemical plant and the shopping centre would have emergency plans in place, and that shopping centre plans would take into account the proximity of the chemical plant. During Stage 2, the general consensus was that strategic response will take some time to set up but well-developed procedures are in place. Participants claimed they would operate on the assumption that they were responding to a HazChem incident. During Stage 3, a focus on public safety informed discussions about the need to evacuate members of the public. Participants considered the school and hospital key priorities for evacuation but felt it was impractical to evacuate local residents. In spite of eyewitness testimonies that the incident appeared to be malicious in nature, participants reported that the emergency response would remain largely unaltered. They would continue to focus on the safety of the public regardless of whether the incident was a terrorist attack or accident. Stage 4b led to conversations about handling the situation with distressed parents seeking to collect their children from school. Participants were concerned about the impact of a mass casualty incident and how it would be handled. It was agreed that the scene would need to be cordoned off in order to collect forensic evidence before being handed back to the Local Authority. The Local Authority would then implement a recovery plan and engage with local businesses and community members to facilitate recovery. Overall, focus group participants expressed a strong belief that health responders are now better equipped than they have been in the past and had confidence in their ability to respond to the incident.

Focus group participants made very few requests for information at Stage 1. Once the incident was introduced at Stage 2, their information needs focused on two key areas: 1) expert off-site technical advice and 2) practical information identified at the scene of the incident. Technical information needs centred on the nature and spread of the plume and information about chlorine, access routes, PPE requirements and the nature of casualties. Participants also wanted to know whether they should be advising the public to ‘stay in, tune in’ or evacuate. Key sources of information were the HPA, CHapD as well as the STAC and strategic command centre that would be set up in response to the incident. Participants repeatedly emphasised the importance of receiving consistent and timely information and advice from the agencies informing the response. At Stage 3, responders’ information
needs continued to focus on scientific advice about the plume and further information about the cause of injuries and casualties with increased calls for more detailed information about the incident, the local hospital, the number of people caught up in the incident, and more. At Stage 4a, the chemical company were considered a key source of information for the investigation into intent, and at Stage 4b, hospital responders requested advice as to whether they should declare their own major incident, as well as information about how long the incident would be likely to last in order to help them manage staff numbers and staff absenteeism. Finally, at Stage 5, participants’ information needs focused on receiving scientific advice about the environmental impact of the contaminant with a focus on long-term recovery. Overall, the information needs remained fairly consistent, with requests for additional depth of knowledge as the response evolved. Awareness of these information needs and identification of the various skill sets/players needed to provide this information can lead to informed discussions about engagement and messaging throughout the response lifecycle in order to ensure that responders receive appropriate levels of useful and meaningful information throughout CIEs.

Health responders’ views and understanding of public information needs and likely behaviours varied. The public were expected to have been engaged with the building of the shopping centre and the location of the chemical plant from the outset. For example, at Stage 1, some participants anticipated the potential for environmental protests in response to both the chemical plant and the opening of the shopping centre. It was also suggested that the public would report any traffic violations on the part of the chemical tankers. As the scenario progressed, the focus group participants expected members of the public to panic in response to the news there had been a chemical incident. Interestingly, while the scenario was still being described as an accident, it was suggested that if the public assumed this was a terrorist incident this would enhance the likelihood of a non-optimal public response. This was balanced by the overall expectation of public compliance to instructions provided by uniformed officers. At Stage 3 there was further discussion about the potential for a panic response from the public and hospital responders felt it was likely that some individuals would unnecessarily present at local hospitals. The conversation turned to the plume and respondents believed that the public in the immediate area would be frightened, regardless of whether the plume contained dangerous chemicals. Individuals outside the immediate area were also expected to require reassurance about their personal safety. In-depth discussions took place as to whether or not members of the public would behave optimally, especially in respect to parents keen to collect their children from school and members of the public inside the REDD centre. At Stage 4a, there was some discussion around the possibility that the public may now be looking to apportion blame,
transforming the situation from an actual emergency to a political emergency. At Stage 4b, discussion about public responses focused on the perception that parents would be worried, and the expectation of non-compliant behaviour from parents was reiterated. There was concern that parents would be unlikely to know the emergency procedures for their children’s schools. At Stage 5, there was further discussion about the likelihood of the public looking to apportion blame after an event of this type leading to the potential for decreased levels of trust in politicians and the chemical company. In spite of this, the health care responders’ assumption of public trust in uniformed responders persisted. Finally, when asked about their view of public preparedness, the majority of respondents highlighted the difficulty of communicating with the public (e.g. lack of interest, lack of awareness) and therefore felt the public would not be particularly well prepared.

With regards to public communication strategies, at Stage 1, Local Authority responders briefly discussed the fact that the public in the immediate vicinity of the chemical plant would be provided with some information and that this ‘information zone’ had recently increased for hazardous sites. At Stage 2, the primary aim of information provision for the general public was to let people in the immediate vicinity know what they should do. There was a very consistent message that local residents should either be told to ‘go in, stay in, tune in’ or they should be told to evacuate. The importance of providing information about what the public should not do was also emphasised. Another primary function of Stage 2 messaging was to reassure the public that emergency services are responding appropriately. The media were described as a primary source of information and it was suggested that an emergency hotline would be set up. There was discussion about a lack of clarity about whose responsibility it would to release the initial message, but all agreed upon the importance of presenting a united message. At Stage 3, the key focus of public communication messages was continued safety advice and it was emphasised that advice should be reassuring, simple and practical. In respect to level of detail, participants believed that information should become more specific (e.g. regarding possible health effects) and targeted (e.g. towards parents of school children) as the incident progressed. At this stage, the importance of finding a credible source of information to effectively communicate levels of risk was highlighted. At Stage 4a, the primary communication aim continued to be the provision of information about what do to and where people should go for further information. Consistency and reassurance continued to feature prominently, as well as the need to update information as required. The majority of participants suggested there would be no change in the information provided to the public in response to the media speculation about intent, although several participants indicated in written responses that the speculation should be acknowledged. Stage 4b discussion focused on the need to communicate the
strategy for longer term recovery to the public. It was also suggested that some ‘reputation management’ may be required if the public start to look to apportion blame. Information sources stayed the same, with the addition of the Casualty Bureau, and it was suggested that all members of the public should be directed to the same source of information (NHS Direct or a designated hotline). At Stage 4b, there was continued focus on the need to provide reassurance and targeted, specific information about health and transport. The need to communicate about long term recovery, including community impact as well as direct impact, was also emphasised, as was the need for more clarity in terms of whose role it is to disseminate information to local residents and to the local hospital. At Stage 5, there was more focus on post-event information, in particular health information, both for those who had been exposed to the chemical and for the ‘worried well’. During the final discussion about preparedness, there was a general sense that inter-agency communication is improving, though interagency conflicts surrounding communication with the public were evident. For example, there appears to be a lack of consensus between government departments regarding how much information should be provided to the public.

The media were viewed as an important and effective tool for public communication and seen as playing a primary role in the dissemination of official and unofficial information. The focus group participants indicated they directly utilised the media, particularly local radio, to provide official updates to the public. However, there was a general perception that unless the emergency services took control or managed to develop partnerships with the media (preferably pre-event) that the media would tend to provide speculative, sensationalist information. Consequently there was a strong focus on the need for a coherent media policy. A key feature of discussion around this issue was the importance of having a joint media strategy across emergency services. A number of strategies were identified for ensuring effective communication with and through the media. The role of new media and social networking was seen to limit the possibilities for controlling the flow of information and further underscore the importance of disseminating accurate information. As a result participants suggested that it is was important to provide the media with access for filming where possible or to explain why access was not possible. In response to the suggestion there could have been terrorist involvement, there was a suggestion that the media would speculate about intent, regardless of public perceptions, but that this could be countered by good communication strategies. Interestingly, there was a largely consensual response that it would be unhelpful to make a statement to the media to indicate that there could have been terrorist involvement in the incident.
5.3 Polish focus group results

5.3.1 Expected emergency response

At Stage 1, discussion focused primarily on planning permission and risk assessment. Participants were generally confident that potential safety issues would be considered during the planning process:

“The employees in one of our sections would give an opinion on building the whole centre, perhaps not because of the fact that there is a factory in its close neighbourhood, but taking into account the safety of the construction work and the evacuation of the access roads. These criteria would have to be met in this respect. That's why I think that, in this case, the chances that this shopping centre doesn't meet the standards are the merest” (GR1, R3)

“We can say at this stage, that both of these enterprises are highly likely to meet the formal criteria on the static security level, that is the security system regulations, aimed at reducing the risk, are checked and put into operation. In other words, nothing wrong will happen as long as a human error is not committed” (GR3, R1)

Two tiers of chemical plant were described and it was suggested that ARC Chemicals would be classified as an upper or lower tier establishment, depending on the type and amount of chemicals stored on site. This classification of the chemical plant would dictate the nature of emergency plans:

“In the case of the lower tier establishment with its own, internal, emergency plan in the event of an accident, a serious industrial accident. In case of the upper tier establishment, these plans will be external. Since there is an internal and an external emergency plan. The external emergency plan will be drawn up by the Regional Police Headquarters and it will lay foundations for any rescue operations undertaken in these works” (GR2, R2)

It was assumed the chemical plant would need to comply with environmental regulations and would be fined if it failed to meet the required standards. However, there was also an expectation that some smaller scale operations may find it more economical to pay fines than comply with regulations:

“I think it is simple economics. It depends on the profitability of the production. If it is profitable to flout the regulations and pay the fines, it is highly likely that the owners will not cease these violation practice” (GR1, R1)

“Some owners prefer to pay the fines rather than to apply for the environmental impact statement. I am sorry to say that, but here in Poland it is sometimes more profitable to pay the fine than carry out all the procedures in order to meet the environmental standards” (GR1, R4)

Participants indicated that regular inspections and safety drills would take place at the chemical plant:
“These practical trainings take place once a year. To be precise, every second year a plant is obliged to do the drill. However, not only does this internal operation plan receive an opinion from the already mentioned specialists, but also from the external ones, that is by the fire brigade. I mean, if a document has been drawn up it means that it must have been approved by the fire brigade” (GR1, R3)

“And we are familiar with this type of establishment, since it is coordinated once a year, at least once a year, which makes us knowledgeable. We visit it and do the drill in this kind of place. Its inspection is carried out by our section. So we have a complete list of the number of chemical substances and the monitoring is also on the part of our services” (GR1, R3)

Medical rescue services and fire services were described as regularly training together:

“Medical rescue services do not take part in granting permits in the system of monitoring shipments of this type. Nevertheless, we closely cooperate with the fire rescue service. We have got our drills together. In chemical plants like this one. There are some places where these kinds of trainings can take place. As a matter of fact, we are obliged to train together twelve times a year. These types of plants would certainly... Twelve, if my memory serves me right” (GR1, R1)

However, it was noted that sometimes drills would be theoretical rather than practical and their usefulness in the event of a real emergency was therefore questioned:

“Such a big plant is very likely to have its own rescuing service at their disposal. However, if the emergency is extreme, some external services such as the fire fighters or special chemical units will get involved. The drills in question prove that declarations on paper are not always easily applicable in practice. Moreover, companies are reluctant to carry out drills, because they lose money. Besides, these drills are frequently underestimated and usually theoretical. And in the case of real emergency, certain moves turn out not to have been practised before which may result in a disaster” (GR3, R1)

At this stage it was suggested the police would play a largely administrative role, providing advice on access roads, issuing permits and organising new routes if required. Confidence was expressed regarding the transportation of chemicals, with public protests described as having more potential to cause problems:

“And in this case, as far as the dangers are concerned, the most risky factors for the police are the social protests. I mean, the possibility of blocking the road, making it impassable... It is common knowledge that chemical transportation takes place in Lodz in great quantities, and this kind of substance is nothing extraordinary. So, the police is mainly anxious about the social protests involved in the problem in question. And we may also be concerned about the problem of giving opinion on the possibility of closing this road for the TIR lorries” (GR1, R4)

It was suggested that the city council would be likely to impose some conditions on the shopping centre, relating to access roads and evacuation, and the fire service would also be involved in this decision:
“As for the fire department, the permit for the construction of the mall could be based on regulations concerning distances and fire-safety roads which will not interfere with other routes leading to the precinct. I assume the fire department could base their decisions on the regulation which says that apart from main roads there should be additional access roads leading to the chemical works. The shopping centre too will be provided with access roads, so that trucks may deliver chemicals and citizens have access to the mall. This will prevent collisions or other threats. This is what the fire department should supervise” (GR4, R3)

At Stage 2, there was an emphasis on evacuation and securing the scene:

“Next, we need to evacuate the area. On the premises of the shopping centre, there should be a person responsible for evacuation. There must be some adequate procedures in case of emergency, which need to be carried out in an organized way” (GR1, R1)

However, some groups concluded there may be no time to evacuate and suggested instead that local residents should be advised to shelter and await further instructions:

“The problem is that it is impossible to evacuate these people. Unless, the police, together with the municipal police, start to patrol the area telling people to move to higher storeys, sealing windows and doors. Chlorine is heavier than air. At this stage, it is all they can be told, as we do not know what is going to happen next... Since it is impossible to seal attics, people are requested to take wet blankets and towels, proceed to the flats on the top storeys and wait, listening to the radio” (GR3, R1)

Water screens were also described as a useful tool if a chlorine leak had occurred and there was no time to evacuate:

“Of course, the chlorine is neutralized by sweating it, that is some water screen is set up, which enables the chlorine flow down together with water. So it poses a threat only as ground toxin. It is a part of the rescuing techniques” (GR3, R1)

It was assumed in the event of a chemical emergency that the fire service would usually be first on the scene and take control:

“The fire brigade is indisputably the leading service here. They will approach the scene of the accident, identify the scale of the problem and declare the red zone” (GR1, R1)

The fire service response was expected to include chemical experts:

“The nearest unit arrives in five minutes and, depending on the part of the city, there is yet another unit on its way. Approximately fifteen people. There are three vehicles for dealing with chemical fires. A fire and two chemical ones. And, to be honest, just one water tank, in the first group. But we assume that all fire units are on their way to the scene of the accident, to extinguish the fire. But the chemical experts are going there first, as we got the information that there has been an accident involving a tanker lorry” (GR1, R3)

There was also an expectation that voluntary fire brigades would also be utilised:
“Yes, in Lodz. 700 firemen are on duty on each shift and half of them are ready to take part in the action. And they will be effective. There are also those voluntary fire brigade units that are connected with The National Centre of Competence.... Voluntary fire brigade units are often as well equipped as the national ones, they employ retired professional firemen who are in command of the units and so, realise their ambitions. If they go in that vein, the voluntary units will soon catch up with the national ones. It means the possibilities will be greater” (GR4, R3)

“There will not be too many of voluntary fire fighters, but at least about thirty people. So they can be helpful as well” (GR2, R1)

The fire service were described as primarily focusing on containing the incident and making the site safe, whilst minimising the danger to their own and other emergency response staff:

“I am not sure, but in the case of this type of fire, the commanding officer may withhold the services for some time, to identify the danger. Although quite common, chlorine is one of the most hazardous substances, which in this case may pose a threat to the emergency rescue services among others. The tanker lorry has already burst so five minutes in this situation are not... it burns with some difficulty. We won't work miracles with it. We won't save it. We have to save the cars parked in the close neighbourhood. The petrol station. Do we know how badly it is damaged? We lack complete information. But... there is a fire there. It must be protected as well. The petrol station caught fire, which means that, for the time being, the petrol pumps and other stuff are likely to be on fire” (GR1, R3)

The fire services were also considered responsible for the medical response, retrieving the injured and taking them to paramedics, who would be held back just outside of the immediate scene:

“A rescue team, a search party. There are 4 teams of this kind in Poland. There is one in Lodz as well, but actually, it is being formed. For today, there is no medical group which is ready to react, which is equipped properly enough to enter the red zone. That's why I am talking about the red zone. There are fire fighters there. The system is different. You can find some medical rescuers among fire fighters as well. All firemen are classified as medical rescuers in the medical rescue system. They are all trained to give first aid with the use of special equipment. They have got, they are equipped. And that's the way it works here. The medical services are not involved to a large extent. Fire fighters themselves are prepared well enough to take some medical action” (GR1, R1)

“The emergency service is dependent on the fire brigade. We are a secondary service too. We partly depend on the police and on the fire brigade. Actually it is the fire brigade that will decide where we should place the ambulance. They tell us to wait somewhere near a tree and be ready to help injured firemen or citizens. So we will be waiting in the ambulance with no safety devices, no gas masks or helmets... because it is the fire brigade that is in charge. They will carry patients to safety. Paramedics are not allowed to get to the danger zone. We have no equipment” (GR4, R1)
Neither police nor ambulance staff would be sent into the red zone as they would not have suitable PPE:

“Neither the police, nor the emergency ambulance service has specialist equipment to protect the respiratory tracts” (GR3, R2)

The primary police role was identified as securing the scene, clearing access roads and providing information to other emergency services:

“The police officers have to secure the zone, not letting people in, but of course letting them out” (GR1, R1)

“The first service to arrive at the scene of the accident depends on the decision of the duty officer. The police arrives first in the event of road accidents or any other type of accident, in fact. Later the rescue services stay in touch. Generally, we are focused on securing the scene of the accident. So if our team is first to arrive, it would meticulously gather information, and the duty officer would coordinate the operations of the remaining services. As I mentioned before, initially, we concentrate our actions on securing the scene. We are familiar with the infrastructure, we already know what happened, we stay in touch with the fire fighters and the emergency ambulance service, and we are trying to isolate the place from the outsiders. Alternatively, we are trying to clear the access roads, so as to coordinate the actions in some way” (GR3, R4)

It was considered unlikely there would be a terrorist attack in Poland, due to lack of perceived motivation or precedent, and it was therefore assumed that the scenario was an accident:

“Of course it is possible that it is... but we cannot state it immediately. Quite the opposite, this suspicion is eliminated first. If the situation took place in Spain, I suppose that a suspicion of a terrorist attack would instantly be taken into consideration. Later on, they would start to think the other way round, wouldn’t they?” (GR3, R4)

However, in the case of a terrorist incident, it was assumed the police would take control and determine the danger zone:

“The actions are coordinated by a fire fighter, unless the problem concerns terrorist attacks. In the latter, it is the police who takes over, as they are familiar with explosions, weapons and marksmen. The police is the leading unit when dealing with the problem of explosions. Fire fighters are not taught how far the pieces of shrapnel, from a parcel weighing two kilogrammes, will fly. The police know such things, so their decision is indisputable. It is because of the safety of the rescuers lives” (GR3, R1)

At Stage 3 there was ongoing discussion about whether to evacuate or instruct people to stay indoors, with evacuation considered the preferred option if possible:

“Chlorine is much heavier than the air, so one of the security elements would be closing the windows and evacuating to the top floors, but in this particular situation I don’t know what the city buildings look like. Apart from that, if it’s possible, we always try to evacuate people” (GR2, R3)
The school was identified as more likely to be evacuated than the hospital, due to potential dangers of trying to evacuate seriously ill patients, although a number of participants thought that visitors and mobile patients might be evacuated. It was assumed that the city would supply buses for any evacuations:

“So I think that it would be relatively easy to evacuate people from this place, especially if there is a road here. Towards the north, the works, or in the opposite direction, to the city centre. So this problem will be dealt with by the city authorities. The Emergency Management is able to provide the MPK buses or even withdraw them from the city and send here. Some emergency points need to be set up at the crossroads, so as people could be relatively quickly evacuated from this area” (GR2, R2)

In relation to the immediate incident, the primary role played by fire fighters was reiterated and there was further discussion about how to manage the situation, including stopping the leak or using water screens to neutralize the chlorine. The importance of setting up a triage area immediately outside the danger zone was a primary theme at this stage:

“We usually start with eliminating all those who can leave the area on their own. When those non-ambulatory, with a green tag (minor injuries), have left the area, those more seriously injured are evacuated by the fire fighters to the safe zone, where there is a doctor or a rescuer performing a triage sieve, depending on the case” (GR2, R3)

“Practically, there is no need to take urgent actions concerning post-traumatic, mechanical injuries which would cause internal bleeding. However, the situation worsens in the case of internal bleeding. We may not have enough time to save his life. A problem of a broken leg is not urgent. The casualty should be positioned properly, with his leg immobilized so as to soothe the pain. He will not require evacuation then. This triage sieve technique is precious in an emergency situation like this one” (GR3, R1)

Logistical difficulties of dealing with mass casualties were also discussed, including the pressure this type of incident would place on local hospitals and the potential need for specialist equipment:

“Thirty-two of the eighty-five casualties comprise fatalities”, “Who cares?” may constitute important information for the mass media, but not precise enough for us. We need to prepare places for those eight casualties. They will need to be transported somewhere where they will be given help. If there are eight children, the hospital which we can see on the map, will not be able to take care of them. They will have to be taken by helicopters” (GR3, R1)

It was suggested that if the incident was too large to be dealt with by local chemical responders, arrangements would be in place to obtain help from neighbouring areas:

“I think that all the headquarters have an organisational plan. For instance there are two chemical groups in Łódź voivodeship, one in Łódź and one in Piotrków. If there aren’t enough people in the Łódź group, because they already took part in the operation, then the group form Piotrków comes to the rescue. If the
operation is really extensive and demanding, then we will have to get extra help from other groups... The management makes all the decisions concerning our operations. The range of the operation is defined by the emergency management who operate on the scene of the accident. If they decide that the operation is extensive and that many people are in danger, then we may get support from neighbouring groups or from our group” (GR4, R3)

At this stage, the police were described as focusing primarily on implementing traffic calming measures to enable emergency vehicles to get in and out of the area. Investigations were considered secondary and unlikely to take place until the incident was under control:

“There would be some simple tasks like helping in evacuation, transporting, etc. Access and exit roads would be secured too. If panic goes off, the roads must be passable. It is crucial that ambulances and fire trucks reach the scene. Other vehicles have no access... Our investigators will take action only when the blaze is extinguished and the fire fighters give permission. Then technicians, policemen, inspectors and attorneys do their job. (GR4, R2)

There was also some discussion in Focus Group 4 about the use of police psychologists to deal with crowd control:

R3: I would also like to say that every time you start talking to such a group of onlookers, there is always a leader among them. I am sure that our psychologist is familiar with such situations. There is a possibility of having a psychologist here at any time. He/she is available 24/7, as well as a police psychologist is.

R2: A negotiator

R3: Unlike a policeman or a fire fighter, the negotiator will easily choose a leader from the crowd and effortlessly lead the whole group out of the danger zone.

It was suggested that once the incident was under control, the fire services would hand overall control to the police and await police instruction:

“Once we finish our operations, we hand it over to the police and we wait on the hard shoulder. In Europe sometimes there is a need for the vehicle to wait on the hard shoulder and sometimes there isn’t. Then, we wait for the police to decide whether we should go back to our unit because we did what we were supposed to. We have staunched the leakage and secured everything. The goods are taken by the carrier. We hand over the documents to the owner and we are free to go. The police take over and all the investigation and prosecution procedures start” (GR4, R3)

At Stage 4a, speculation that the incident was a terrorist attack was considered unlikely to affect the immediate emergency response:

“Well, it does not change much. We only take the proper steps to deal with the witnesses properly. We need to interrogate them, ask about various things. Find out what they saw and take some further action on the basis of the collected data. But as far as the rescuing is concerned, it wouldn't change anything” (GR1, R4)
“For the time being, it does not change anything as my colleagues will still be rescuing people” (GR2, R1)

However, participants felt they would approach the scene with more caution if they were prewarned that it could be a terrorist incident:

“We would have to get the information about the bomb under the tanker lorry, which could exert an influence on our actions. Each of the commanding officers would order his people to stay at a distance.” (GR1, R3)

“The police bomb disposal units would not approach it because of the chemical hazard. The fire fighters would flee because of the danger of explosion, so in reality we would wait for the problem to solve itself” (GR1, R4)

There was also an expectation that suspicion of terrorist involvement would lead to increased security measures:

“As I see it, there is an additional factor to be taken into account here. From the perspective of the terrorist action, we should stay focused on the problem of the recurring attack. I mean the chemical plant. The security should be tightened. Otherwise, they may miss supper in the evening. The same applies to the railway station, the school and the hospital. They should be under strict control” (GR1, R1)

However the tendency for participants to assume it was not a terrorist incident persisted:

“There are countries where such things happen on a daily basis. A terrorist will crash his van into a building and ... Contrary to ours, the English may have a different view of such an incident. We would consider it to be just an accident or somebody fainting. The witness may claim the driver did it on purpose, but we know how things are in Poland. Drivers can do their work for two days without stopping. They may simply fall asleep behind the wheel and crash” (GR4, R3)

“Such a man will have to be detained. He will have his blood tested for alcohol or drugs. For instance Ukrainians or Belorussians can drive for 40 hours, but they are under the influence of amphetamine. Such things happen. This driver will be detained for blood tests and questioning. If we suspect it was intentional, we inform the prosecutor” (GR4, R2)

At this stage there was further discussion about evacuation plans and procedures, as well as the need to convince the public of the severity of the situation in order to persuade them to evacuate:

“If evacuation procedures have been introduced and there is this possible danger, the police will persuade people to leave their houses. If danger is real, they will have to convince people and drive them out of the danger zone” (GR4, R2)

It was also suggested that evacuated areas would need to be policed to prevent burglaries:

“Squad cars equipped with sound systems must go round the area, inform people about danger and tell them to evacuate. Additional units must be sent there to protect those people’s property... Protect their property from thefts and
break-ins. When people leave their houses in panic, they often forget to lock the doors. There are always thieves ready to take advantage” (GR4, R2)

At Stage 4b it was suggested that by this time an emergency management team would be forming, consisting of the provincial governor, the main chief of the police and the fire department:

“The real coordination among the services started, in fact, at 3 pm. The actions of the fire fighters and the police will be coordinated, let’s say, by the headquarters. At the same time, a decision about the evacuation is being made” (GR1, R3)

There was further discussion about bussing children out of the immediate area to avoid traffic jams and it was suggested that access roads would be closed to the public:

“To control chaos in schools and hospitals special units will be sent. The danger zone will be evacuated instantly. The police will block roads and kids will be driven out in coaches to prevent traffic jams if parents come in their cars to collect their children. All the access roads within a radius of 3 to 6 km (depending on the crisis centre) will be closed. Nobody will be allowed to collect those kids, patients or any personnel” (GR4, R3)

At this stage, it was assumed that chemical specialists would be arriving to provide a more accurate prognosis. There was also further discussion about factors that would influence evacuation or sheltering advice:

“If there is no information that the chlorine has already spread we are bound to evacuate people. We would try to evacuate them from this region. If the cloud has appeared, in case of the taller buildings, we could inform everybody that it would be safer to lock and the chlorine would not reach the tenth floor, or it wouldn’t even get to the fourth one. Keeping people in is risky. But the cloud would gradually change its location, thanks to the wind” (GR1, R3)

At Stage 5, it was expected that 24 hours after the incident, chlorine levels would continue to be monitored and buildings would still need to be checked before there could be a return to normal:

“We would not let the people enter the buildings if all the cellars and the rooms remained not inspected. We would not probably be able to check them it in twenty-four hours. We would do it gradually. Especially, as in the first twelve hours the chlorine would still be in the air. We would spend another twelve hours searching the buildings” (GR1, R3)

At this stage there was an expectation that roads would be re-opened where possible, but the immediate site would remain cordoned. The shopping centre would be secured and inspected to establish whether the building was safe to use and a new permit would need to be issued:

“So I think that something needs to be done about the shopping centre. It should be secured and the access to it completely denied” (GR1, R2)
“Before re-opening the mall we will ask the construction supervisor if its further use is possible. Without a new permit people will not be allowed” (GR4, R2)

The police were described as looking into the cause of the incident, but it was expected if it had been established this was a terrorist attack, the investigation would be handed over to the internal security agency:

“There were three witnesses. It seems to be clear that the prosecutor excludes the police. The ABW (Internal Security Agency) will take over. So our role is limited to giving aid in the casualty emergency and passing on information about the patients' whereabouts and the potential fatalities. It is the ABW that will conduct the investigation procedures, together with the prosecutor” (GR2, R1)

Longer term concerns focused on environmental impacts, for example whether water had been contaminated:

“The problem lies mainly in the impact exerted on the environment, the soil and the bodies of water. So now it is the matter of environmental protection” (GR1, R3)

At Stage 5, participants were also asked about their ability to respond to this type of emergency and responses were mixed. Some participants felt practice drills indicated that emergency services were unprepared:

“Ladies and gentlemen, as I said before the meeting: we simulate such situations with fire and emergency units and even with schools. Last year our units took part in a bomb scare simulation in a school. We followed the algorithm. In course of the operation it appeared the explosive was a dummy. If it was real, it would turn out we are not ready to react” (GR4, R2)

Others felt it was simply not possible to prepare for this type of event. For example, in Focus Group 1:

**R1:** To be honest, nobody feels prepared for this type of emergency. Nobody can be sure. The scale of such emergency is impossible to anticipate. Everyone is terrified. And it has to be said openly, we had better do some practice than face the problem in reality. Correct me if I'm wrong. So nobody is going to feel prepared for it. There are some shortages as well, and we report about them. But we are not going to raise this issue right now.

**R2:** The problem is that the operation can't be practised in real life. We would have to evacuate a number of people. We can make some forecasts concerning the time at which a certain number of people are going to be evacuated. But... who would be willing to take part in such evacuation drill? It could be done in some school. The school building can be evacuated. The truth is that we are prepared only for what is described in the procedures. And our reaction to them. Of course, there are some emergencies which are not outlined by the procedures, so in this situation we need to rely on our experience and the previously practised drills.
Issues concerning the efficacy of the 112 emergency telephone contact were also highlighted:

“I have encountered quite a few problems with the emergency number 112. Unfortunately, the police seems to appear in a bad light. After graduation I started to work as a dispatcher in Lodz. Once I got a call from a journalist with a question and some grudges describing an incident that took place the day before. There had been a 112 emergency call concerning a man lying on the street. The caller didn’t know if the person was dead or alive, as he was making a phone call. The fact that the phone call was made from a car played a vital role. An hour later the driver was going past the same man, still lying on the street. It meant that there had been no intervention. So the journalist bore grudges against me that such a situation had taken place. I explained that when an emergency phone call is made using the landline telephone, the caller gets in touch with the fire fighters, while in an emergency call made using a mobile phone you are put through to the police” (GR2, R2)

However, other participants felt that lessons learned from practice drills meant that emergency services were now better prepared to respond than in the past:

“Once we did a practical drill at the Lublinek Airport. It concerned triage sieve at the scene of the air crash. The emergency drill has been organized twice so far. The first trial did not contribute much. In practice, it turned out that there were some deficiencies at each stage. It should not be surprising, as the problem of mass casualty emergencies is not discussed so frequently. Medical students did not deplore this issue until recently. Neither did the rescue doctors. So there were such cases when the first team arrived at the scene, took the first casualty and they went away. Now, the first team to arrive is supposed to carry out the triage sieve... It is not easy, because when you approach an injured person, you would like to provide him with help. But it turns out that they are glanced at cursorily, fifty seconds per person. So the drill is extremely important. The other one was much better. The drill was carried out last year, in Grodzińsk. It was a simulation of a train crash. And it was very-well organized. After the whole rescue action, we made a list of the obstacles we had encountered and the deficiencies, which were passed on during the break. Later we performed the same tasks, this time drawing conclusions from the previous observations. And our performance was better again. We have to practice, simply” (GR2, R3)

“Our unit has been drilled in those alerts and I must say that discipline and responsibility among policemen is growing. If the alarm is raised, we simply pack our things and go. (GR4, R2)

It was also suggested that although the initial response to the incident would be somewhat chaotic, once a crisis centre was formed, communication flow would improve and the response would become more organised:

“There will be a total mess, as long as the crisis centre is not formed. The crisis centre will take decisions and assign tasks to rescue services” (GR4, R3)

Those who felt they were not particularly well prepared attributed this to the unpredictability of events and lack of experience:
“Most of us will not. I have been a policeman for many years. I’ve been through many critical situations, but I have never experienced anything like this. It’s hard to say how people will react. Theoretically, we are ready to face it, as we are drilled in alerts, evacuation and so on, but it is only a drill. What if a policeman gets a shock or gets injured?” (GR4, R2)

Concerns about preparedness were also attributed to perceptions about limited resources:

“Of course, practical drills are carried out. There will be rescue services and the equipment, while the reality is different. The hospital will, in fact, have ten ward beds available, and the number of casualties is 80. So somebody will have to try to figure out the solution to this problem. Instead of two hundred policemen, there will be 50. And the time will be wasted. The same applies to the fire fighters. Fifty, instead of two hundred” (GR2, R1)

“I will put it this way, we are ready to take care of forty-six people suffering from chlorine burns, but not fifty-three. The number of hospital beds, respirators, oxygen, water, etc. is insufficient. This mechanism does not work effectively yet” (GR3, R1)

Inadequate legislation was also considered to be a potential hindrance:

"The complexity of this issue called 'crisis' arises from the fact that, in theory, it is the emergency crisis management, which, unfortunately, has not got the right tools to deal with this problem successfully. There is a number of people who are ready to take action, however, they are deprived of any legal instruments to implement certain procedures, as the crisis management units lack appropriate means... First of all, it is a legal problem, which constitutes a kind of a loophole enabling various aborts/nonfeasance. However, there are certain regulations, which require the hospitals to design a plan in case of extreme emergencies, a substantial number of casualties. Since there is no outline of such a plan, in reality, certain internal procedures of hospital evacuation are described. However, in the case of an overwhelming number of casualties, the situation is not regulated by law and nobody does any related drills” (GR3, R1)

Lack of co-operation between different organisations was also highlighted as a potential problem:

"Not to mention constant feuds between the emergency ambulance service and the very hospitals. The ambulances with patients inside wait for hours on end at the entrance to a hospital, not knowing what to do, as the hospital refuses letting the patient inside without good cause. That is what is happening day in, day out. Moreover, in the case of a greater number of casualties, there is a complete chaos. So this kind of service seems to be at a standstill” (GR3, R1)

Those who were positive about their capabilities suggested that co-operation between different agencies was improving year on year and that funding had been increased, enabling more effective responses:

“Each institution is well-prepared in terms of organization. The cooperation is improving. We are doing better and better every year. And the government starts to notice our financial needs. Otherwise, we wouldn't be able to handle the problems” (GR1, R4)
5.3.2 Health responders' information needs

There were no references to health responders' information needs or sources at Stage 1. At Stage 2, participants were keen to know the exact contents of the lorry and the plume. This information was expected to be displayed on the side of the tanker and communicated to the police by fire services:

“And the identification is certainly going to take place, since the fire fighters arriving at the scene of the accident first, already know from the labels what the contents of the tanker lorry is... The police arrive, and if the duty officer is not stressed out, he will inform the police officers what to do. They will read out the information on the label and report it to you. So we are already a few minutes late with the information on the type of substance, right? But we can make an assumption when we are on our way. The duty officers should pass this information on to one another” (GR1, R4)

Once it was established that it was a chemical incident, information needs centred on determining the scale of the problem. Chemical experts from the fire services were expected to provide initial information:

“I assume the chemical experts are on the scene of the event, defining the scale of the problem. If it's chlorine, then we can take some preventative measures, I mean the chemical experts and at most... First, we should focus on reaching the destination and determining the scale of danger. Verify if it's chlorine, in case of which we have to think about the citizens as well” (GR1, R3)

The importance of knowing if the first responders on the scene were adequately prepared was also highlighted:

“In this case we need to take into consideration the fact, that the first units to reach the scene of the accident is definitely not sufficient enough. And it is also vital to know if they are adequately prepared” (GR1, R3)

Fire and ambulance services were expected to communicate with each other whenever there was an incident. However, the police were described by Focus Group 1 as the last service to be informed about the incident:

**R2**: Which department was informed first and who was it informed by. In reality it varies.

**R3**: It will certainly be our department since we are dealing with a fire here.

**R1**: Or we, but you [addressing 3] are more likely to be informed about the accident first.

**R3**: Irrespective of the situation, emergency ambulance service and the fire rescue service inform each other in case of this type of accident.

**R1**: The third department to be informed about the event is the police service. It is obvious that their presence at the scene of the accident is substantial.
R2: And we are informed last.

R1: Yes. They are informed at the very end.

R4: And you should be informed at the very beginning.

Some concerns were also expressed about the general quality of communication during the early stages of an incident:

“The first identified danger to be faced is chaos in communications. It’s because these types of situations, i.e. dynamic situations, are characterized by the dynamics of passing information at the initial stage. It is very often the case that the chaos is so complete, that we receive the same pieces of information even three times in a row, while we are not informed about the most important things” (GR1, R4)

It was suggested that the media would provide information to the Safety and Emergency Management Department at the Voivodship Office:

“The complexity of the situation depends on the scale of the accident. It is very often the case that there is an individual who is very likely to call the police, the fire brigade and other emergency services. He will also take some photographs, call TVN [a well-known Polish television channel] or get in touch with a journalist, who, instead of calling the emergency services, will immediately get in touch with us, and ask if we have been informed about the accident. And that’s a signal for us, that something has happened. We verify it instantly, replying that we are familiar with the situation. And get in touch with... It depends on the situation. It is crucial to take a prompt action, rescue and evacuate the people, starting at the initial stage. And it may happen that we are not informed about the accident right away. It is me who calls and confirms that the accident has really taken place. I ask about the scale of the event. Then our reaction is adequate. At the very beginning we need to inform the director of the Emergency Management and the provincial governor. It depends on the event. If one or two cars are involved in the car crash and the road is blocked, I will not get in touch with the provincial governor. But in this particular case, it is difficult to say, we are dealing with chlorine. The director or the provincial governor would be informed” (GR1, R2)

However, emergency responders would not use the media as an information source:

“We, as emergency rescue services, are not interested in mass media, as we have got our own way of sharing information. Of course, we are flooded with a large amount of data, we receive emergency calls, but in fact, we rely on our own information and wait, gathering forces in the meantime, approaching the scene of the accident” (GR1, R1)

At Stage 3, information needs focused on enabling a decision about evacuation and establishing the scale of the incident to ensure emergency response staff took appropriate action to protect themselves:

“But in this case, we need to bear in mind, that if it’s just a fire, and it’s the red zone, all the emergency rescue services can approach the scene of the accident relatively closely. Is that right? And now, we need some information if
we are dealing, at the initial stage, with an immediate leak, or just a fire, and the leak from the chlorine tanker lorry is taking place after 20 minutes. It is crucial, as in the case of an immediate leak, the commanding officer would extend the red zone, and all the emergency services would abandon it, so they would mainly flee here. We would escape from the danger and organize the zone afterwards. If we are dealing with immediate leakage of the chlorine, it's obvious that we are steering clear of it, and the yellow zone is going to become red, as it is dangerous there” (GR1, R4)

It was suggested that computer modelling would be used to make predictions about the spread of the plume. The driver of the tanker was also considered a potentially useful source of information regarding the contents of the lorry:

“A visit to the scene will be performed and if the driver has survived, we will ask him what the load and amount was and which chamber was filled. The tanker consists of four chambers. If often happens that some are empty. One may be full. If we know which are empty, we do not get connected to it. All tankers used for transporting chemicals are equipped with pneumatic valves or buckles which are displayed on the dashboard. Firemen often do not know how to interpret those displays, that is why the driver will be helpful. We cannot pass him on to the police just like that because he is a valuable source of information. It doesn't matter whether he found himself on a little-travelled road or near a patrol station. We must know the contents. It may be that two chambers are filled with a given substance and the third one with something else” (GR1, R3)

Safety staff at the chemical plant were also described as an important source of information, as were chemical experts from local universities:

“I suppose such a big chemical institution has its own internal safety service. These people definitely have the technical know-how. The know how to act so they would be very useful in such a situation. In every municipal and provincial headquarters there are many chemical coordinators who can help us, should such a need arise. All we have to do is call them. We are not experts in chemistry. We have some experience in it but we don’t know how to deal with every chemical compound. We know how to deal with chlorine. But for chemical operations we can ask for a coordinator, a civilian from the polytechnic who will come and, as a theoretician, give us practical tips. He'll say "It spreads this way, it is heavier than the air, it will move, pay attention to this, pay attention to that". Anyway, the program we can use on the scene of an accident shows us the whole procedure we have to follow. It tells us how to deal with such a chemical compound. Using this information we go through all the stages” (GR1, R3)

The need for good communication between ambulances and hospitals was also highlighted:

“There will be additional ambulances needed to transport patients collected from fire fighters. Those patients will be sent to hospitals, but here good communication is important. They cannot be placed in one hospital so as not to overload it” (GR4, R1)

At Stage 4a, it was suggested if it were a suspected terrorist incident that further information would be required about the driver of the chemical tanker. If the witnesses were believed, it
was expected the Internal Security Agency would be informed and would be able to verify whether it was a terrorist event:

“If we were reported by the police that we can suspect a terrorist attack, we might get in touch with the ABW (the Internal Security Agency). It would depend on the way it is reported by the duty officer in WSK. Whether he would say it is impossible, or they are just suspecting something. It would depend on the form of the verbal communication. Was it real, we would call and say that there is a suspicion... We do not know anything about their actions, their operations are top secret. But they might have had some trails which could be precious to us. Some information that they had suspected something to happen. Then we could report it to the police, tell them to get in touch with the ABW, and then the former could pass the information further, supporting their actions by special clauses” (GR1, R2)

At this stage there was further discussion about the need for information about the plume and spread of the incident. It was suggested this would be difficult to obtain and would probably take some time:

“It is possible to make the calculations for the danger zone and the very leakage. There are a few programmes good enough to calculate it. This can also be done using a calculator, but it’s time-consuming. And we need to get acquainted with the details concerning the leakage. The quantity, the pressure, the amount of the chlorine left need to be entered into the calculation program. As far as the weather conditions are concerned, we are dealing with the worst-case scenario here. The day is bright. Ideally, the day should be rainy. But in this case, the situation is even more complicated by the fire, which makes it difficult to do the calculations concerning the size of danger zone. I will go further. It would be better if the zone was extended purposely. It can’t be too small. It’s obvious” (GR2, R2)

At Stage 4b, discussion about the need for information about the spread and movement of the plume continued and the fire services were seen as the primary source for this information.

“The commanding officer would, at most, coordinate this operation, while we would probably fetch a few, two or three specialists, who, first of all, would be thoroughly familiar with chlorine, that is, they would know how it is going to behave, or what compounds are possibly going to be released in the process of burning. This is the kind of information we need. It would certainly enable the headquarters to make more accurate prognosis concerning the spreading of the chlorine. But I’m afraid it’s too early a stage to have the map ready. It would be more feasible later... But the initial calculation concerning the hazard area would be done quickly” (GR1, R3)

Again the chemical plant itself was cited as an important source of information about the type and quantity of chemicals contained in the tanker and The IMGW (Institute of Meteorology and Water Management) were also cited as a useful source of information.
At Stage 5 there was further discussion about the importance of good communication between responding organisations, both in terms of obtaining the information required for effective on-site response and in co-ordinating the medical response at hospitals. For example, the following discussion between a medical responder (R1) and local authority emergency officer (R2) in Focus Group 1:

**R1:** We will be dealing with information sharing. We are going to deliver information about the whereabouts of the casualties. We will be busy transporting them. We need to be ready for, so to say, more casualties. We will have to organize first-aid posts, if the city doctor asks us to. There is one hospital. A big city. So, perhaps, it would be a good idea to provide a few first-aid posts in order to... some kinds of hospitals at these posts. But these decisions are not taken by them [directed to 2]. They have their own emergency headquarters.

**R2:** The doctor coordinating the medical rescue services is also present at the meeting of the Crisis Management Team. And it is a kind of situation, I haven't mentioned so far, but we were talking about

**R1:** We switched to the discussion about taking action.

**R2:** Right. About the action which is going to prevent the substance from spreading. Speaking of the medical rescue services, it is a cooperation between all the hospitals with available ward beds. It is important to establish where to send the ambulances with the casualties. Of course there are also come private emergency ambulance service units. They can also get involved in providing a sort of help. It would depend on the procedures and the scale of the emergency.

### 5.3.3 Expected public response

At Stage 1, there were differences of opinion regarding public responses to the news about the opening of a shopping centre in the vicinity of the chemical plant. Some participants expected the public would complain to the Voivodship office and that police would have to deal with public protests:

“So we may be sure to expect a wave of social protests over the number of TIR lorries, which will run through the city. Polish citizens are known to be quick at organizing committees, so they would probably set up a provincial one, forcing the Traffic Police Department to solve the problem and build a ring road around the city” (GR1, R4)

Whereas others felt it would be unlikely the public would be concerned:

“I'm a bit surprised, because if there are some chemical works in Poland, close to a neighbouring town, it means that half of its citizens work there. So people do not protest against the expansion of the works, as it is their workplace” (GR2, R2)
At Stage 2, there was an expectation that it would be difficult to persuade the public to comply with instructions to evacuate:

"Unfortunately, in the case of emergency, it is typical of the Polish society to see with their own eyes what kind of danger it is, instead of evacuate" (GR1, R4)

The public were also characterised as generally disinclined to comply with requests made by emergency services:

"There is one more thing. It is this human factor. In Poland, it is very often the case that when people are requested by the police to do one thing, their reaction is quite the opposite, which is incredible" (GR3, R4)

This was attributed to a very relaxed response to emergency situations:

"So we will finally come to a conclusion that Polish people need to be educated in the field of emergency management and hazards... This issue must have been raised several times, as Poles show a tendency to get attracted to, instead of run away from the danger" (GR1, R4)

"The reaction of people is most surprising when there is a bank robbery. I'll give an example: a bank clerk is taking some notes, a robber approaches her, asking for money. The lady gives it to him and goes back to writing. The bank clients look around, the robber takes the money and leaves... The clients stand in a queue. The bank clerks continue their work" (GR3, R4)

However, this was not a consensual characterisation of the public response, as others expected there would be panic:

"But it needs to be announce in an appropriate way, so as not to create widespread panic" (GR2, R2)

"I used to work in emergency transport and once we went to Częstochowa with a patient. When we arrived at the hospital, a nurse came up to us and asked us what was going on in Warsaw. We did not know because we had no radio in the ambulance. She told us a biological bomb had exploded in the subway. That was about 7 years ago. I did not participate in that operation because I was out of town. Aleje Jerozolimskie and Marszałkowska streets were immediately blocked. It turned out that someone called the police and said they had planted a biological bomb in the subway. As I said, I was away, but I know that people panicked. All the media announced that one person had died of poisoning and that many people were missing... Some panicked and started calling their families telling them to close all the windows and block air intakes with damp towels. People’s reactions were really strange. When we came back, the whole operation was over. It appeared all the drugstores ran out of atropine which is considered to be a first-line drug in biological danger" (GR4, R1)

At Stage 3, there was continued discussion about lack of public compliance during evacuations:

"And it is worth mentioning that we are in Poland... I'm not sure if I have shown this to you [addressing other participants] I've got a short film presenting the
explosives in Manchester. The police forces. They evacuated four districts of
the city in seven minutes. Nobody asks there if they need to be evacuated. The
alarm was set off. I suppose they are better organized than in Poland. The
evacuation took seven minutes, covering four districts. The bomb destroyed all
the four districts. But it's just a film. It is twelve minutes' long. They managed to
carry out the evacuation. Here in Poland, it is not feasible" (GR1, R4)

There was also further discussion about wider issues with lack of compliance. For example,
there was some discussion in Focus Group 3 about public disinclination to allow emergency
vehicles to pass:

R4: There is a situation which always makes me laugh. When there is an
ambulance coming, drivers tend to pull over. When there is a fire engine
coming, drivers pull over again. But when there is a police car on its way -
everybody cuts in on it!

R2: No way!

R4: It was noticeable even when I was on my way here. I haven't been to Lodz
for a long time. I have to admit that the drivers here stick to the speed
limits. However, every time I found myself in a part of convoy in Pabianice,
the car drivers went to the middle...

R2: They repeatedly cut in on the ambulances as well. It is a nightmare.
However, if there is a police car behind, which happens once in a blue
moon in fact, we gave no problems to get through.

There was, however, also continued discussion about the possibility of panic and the
potential for patients with minor injuries to cause difficulties was also raised:

“If I could just put in here...The casualties suffering minor injuries... Well, from
their point of view, their health is the most important thing. So, contrary to
appearances, the injuries perceived by us as minor and can wait, may, in fact,
become the problem of utmost importance for the casualty. In this case it is
important to diagnose the patient, the injured casualty and tell him to wait
patiently his turn to receive first aid, and for any further actions. He should also
be instructed not to spread panic and create unnecessary chaos which is
disturbing” (GR2, R1)

There was also an expectation there may be some general civil disobedience:

“In this case the voivode can introduce one of the states of emergency, which
frequently involves the restriction of public rights lasting for some time. The ban
on walking down the streets would be implemented, so as to avoid the problem
of marauders” (GR3, R1)

At Stage 4a the speculation this was a terrorist event was perceived as having the potential
to cause panic amongst the general public:

“Passing this information on to the mass media would be the first step to create
panic, a complete panic, on the premises of the city” (GR1, R4)
“In other words, the news are disclaimed at the previous stage. We do not want to create panic. The fact that there are somebody saw something... there were three people and each of them might have seen something different” (GR3, R4)

However, it was assumed that the public would not assume it was a terrorist event, as the probability of an attack in Poland was perceived to be very low:

"We are not afraid of terrorist attacks. It’s peaceful here. Like country like terrorist attack” (GR4, R1)

"The probability of a terrorist attack in Poland is really low” (GR4, R2)

At Stage 4b there was an expectation that parents would try to collect children. There was also further discussion about the tendency for people to want to travel to the area out of curiosity, as well as further discussion about the perception that the public would tend to ignore instructions provided by emergency services. This was attributed to a lack of recognition that the emergency services are there to help the public:

"And the very problem with cutting off the access roads. It is unimaginable. When people see a barrier, because the road is closed, they notice the pavement, so, this is it. I think that if we put up a “No entry” sign here, informing about the road works, which would spread across the whole width of the road, leaving just a narrow path for pedestrians, not for vehicles, and two metres away there would be a huge hole in the ground, let’s say 4x3, then I am ninety per cent sure that the following day there would be at least three cars in the hole. That’s the way it is. I don’t know. Perhaps in the forthcoming twenty or thirty years people will realize that police and fire brigade do help them, instead of doing harm. And here it is quite the opposite. People think they are know-it-alls. And so they act accordingly” (GR3, R4)

It was also attributed to Poland’s history of communist repression, with opposition to authority considered a survival technique in the past which may continue to inform lack of compliance in public responses:

“RBP Department of Public Security, which in communist times played a repressive role, now is trying to show how it is concerned about the national welfare... And in the past the department was a tool of repressive regime... Brawling or the opposition towards authorities helped this society to survive and not become completely degenerate. On the other hand, there is a decline in authority as such, which leads to the contempt for professionalism, Professionalism is, in turn, the reflection of having a high standing” (GR3, R1)

At Stage 5, there was further discussion about non-optimal public responses. This included speculation that health concerns may cause individuals who were not directly affected to place a strain on health services:

“Coming back to the problem in question: it doesn’t matter if the danger is real. People will occupy hospitals, because they are afraid of their health. On the other hand, they will call an ambulance just because they need advice. I hear it’s similar in England” (GR4, R1)
There was also ongoing concern about the lack of public response to emergency situations. For example, the following discussion in Focus Group 2:

**R1:** I expect a mob of nosy onlookers.

**R3:** That's right. They will be the first at the scene.

**R2:** I'll put it this way. When the alarm sirens are on, hardly anyone would try to find out what the problem is. The sirens are usually on and on. Announcement issued orally is much better than the sound alarm.

**R1:** When we turn to people saying ‘This area is contaminated. Move away, please’, they respond the following way: ‘No, no, no. I’m just... I’m going to be OK’. We are a strange nation.

**R2:** Or, when it comes to the evacuation orders, people tend to say: ‘I will not go because I’m going to be robbed’.

**R3:** ‘I have left my bag there’.

**R1:** When there is a fire, we sometimes have to use force to evacuate people from the neighbouring buildings.

**R2:** There are floods and people stay on their farms.

Participants in Focus Group 4 also discussed non-optimal public responses during emergency incidents:

**R1:** I wonder why people will keep looking over your shoulder. Someone has been run over by a train, his leg cut, we are trying to help him and all of a sudden 30 - 40 onlookers gather round. And the group is getting bigger and bigger. We can hardly breathe there and they will be just standing there. I don’t know. If I am not on duty, if I know I can’t help, I just don’t come up. Why should I? Is the view that fascinating? They will simply disturb. But they are so interested ... with their mouths open.

**M:** They need a professional instruction. They might not realise they are disturbing.

**R1:** I think they do, as they are always chased away, but they make a fuss if we tell them to clear the exit. It’s a kind of really weird curiosity. I think the media should take care of it.

**R2:** It’s like in this commercial: “… It’s priceless to see it”

**R1:** I remember I was dressing somebody’s wound and there was this lady who pulled me by the hood, because she wanted to see it. I was startled. My colleagues were just looking at me in surprise. I thought it might have been some relative of hers.

However, there was also further speculation about the possibility of a panic response:
“What worries me most, however, is the reaction of people, which I can't predict. Their irrational behaviour, suggestions from the neighbours. Fear and panic” (GR1, R4)

It was also suggested that despite surface lack of compliance, the public would pull together in the event of a real emergency:

“However, Poles are a strange nation that can put themselves together if something goes wrong. As long as everything is alright, they will spend time quarrelling. Luckily, there has never been a catastrophe in our town. I simply cannot imagine it. I think everybody would rise to the challenge” (GR4, R1)

Despite the ongoing description of a non-compliant public, some medical responders felt the public would respond positively to their instructions and a police respondent suggested that uniforms are helpful for enhancing compliance:

“I have to admit that people don't have any discussions with us. They listen to what we are saying. They assume that we are aware of what we are doing. There are no meaningless discussions. There are no such situations. We can get into a discussion with the mass media, because someone starts pushing, but it's rather not the case of the average people (GR1, R1)

“But above all, as my colleague has said, they must see the uniform, which works well when performing our duties. But when we are dressed in plain clothes, there is nothing” (GR1, R4)

When asked about public trust in responders, fire fighters were characterised as the most trusted and therefore best placed to encourage people to evacuate if necessary. However, it was also suggested that people may be more likely to listen to a priest.

At this stage participants were also asked about the public's ability to respond to this type of incident. The majority felt that the public are not prepared for such events:

“No, they aren't” (GR2, R3)

“They aren't. Absolutely not” (GR3, R4)

Consequently it was suggested that the public need better education regarding how to respond to emergency situations:

“I would focus on emergency preparation of at schools. It would be a good idea to introduce a subject in which children could learn how to behave in emergency situations. Starting from the primary school. They should be taught the basic fire drill and proper patterns of behaviour. Together with training them in first aid. Our emergency services may be well-prepared in terms of organization, but these are the very citizens who may foil all our attempts” (GR1, R4)
5.3.4 Existing public communication strategies

There were no references to public communication strategies at Stage 1. At Stage 2, the majority of participants focused on the need to provide brief factual information to the general public:

“There is nothing to inform people about yet. Actually, we can say that there are some diversions and the centre is cut off. The only thing we can say is that there was an emergency and they must steer clear of the scene of the accident, give it a wide berth” (GR1, R1)

“There was a road accident; due to traffic problems the shopping centre needs to be steered clear of” (GR2, R1, written response to ‘what information do you think the public should receive at this stage?’)

Despite the focus on the provision of limited factual information, one written response did indicate the need to reassure the public:

“To move to upper floors (how to behave); about the level of risk (weighed); reassuring; about the directions of evacuation; about a place where one can be given medical help (people being able to walk); about the emergency telephone number (where it is possible to receive information)” (GR1, R1)

The primary aim of information provision for members of the public in the immediate area was to let them know whether they should shelter or evacuate. If the public were required to shelter, they would also be advised to go to upper floors, taking wet blankets and towels to seal windows:

“It is important to play the announcement back from the tape, asking people to go to top storeys, instead of talking all the time. Since it is impossible to seal attics, people are requested to take wet blankets and towels, proceed to the flats on the top storeys and wait, listening to the radio” (GR3, R2)

Three written responses mentioned that the public should be provided with information about the level of risk, including minimising risk of losing property as well as information about health risks:

“What to do in case of this type of emergency in order to minimize the level of risk to health and the risk of losing property” (GR3, R2, written response)

However, it was also suggested that unpalatable information should be withheld from the public:

“It may so happen that, at the early stage, there will be thirty-seven casualties suffering the consequences of the explosion, but there will only be two rescuers wearing these protective overalls, unable to kneel down. We are aware of this fact, however, the public will not accept this type of announcement. They will not be ready. This information is not revealed. People are not informed that our capabilities are limited” (GR3, R1)
Methods of communication discussed at Stage 2 included the use of the public-address system in the shopping centre. There was also some discussion about the use of public announcement equipment in emergency vehicles, but it was suggested there would be some reluctance to use this equipment due to lack of training and the poor quality of the sound:

“One of the most popular, standardized methods of communication is the audio evacuation equipment. However, it is not easy to operate, as in those, there are microphones, but they either make a noise or the sound is inaudible. So it is rejected. The procedure is not drilled. They are reluctant to use it. In practice, each siren is equipped with a microphone, but since the procedure is not practised it cannot be applied, because people cannot operate it. It will either be inaudible or make a whistling sound. Besides, this technique is not described in the procedure” (GR3, R1)

The consequences of poor communications were discussed:

“One of course, referring to the example of the Gallery Shopping Centre in Lodz, the announcement made was not precise, not clear so the actions were not right, for example the gates were not lifted. The announcement should have told mention the evacuation, ordering people to proceed to the emergency exits, leaving the cars, bags, computers behind, as the danger is really great. It was also possible to inform people about closing the shops earlier than usual and asking them to finish the doing shopping as quickly as possible. Either or. It is very often the case that people are rushed right before 10 pm. And the announcement was not clear enough. It was not clear whether it was an emergency or not. One gate was switched off by the security guard while the remaining ones were not. There was a pregnant woman who was not able to reach the gate as she stopped her car a bit too far. If this emergency really took place, there is a lesson to be drawn from this. The chief of the police imposed strict controls on new building, meeting all requirements, however nobody took care of the content of the very announcements. They have to be imposed, prepared in advance. The speaker cannot improvise” (GR3, R1)

This led to the suggestion that messages should be pre-recorded. It was also suggested that a male voice should be used to enhance public compliance:

“For psychological reasons the announcements should be read out by a man. People are more willing to follow instructions given by a male than a female voice. It seems to be crucial, as asked to go in a certain direction, Polish people tend to do quite the opposite” (GR3, R1)

At this stage, the police were described as playing the primary role in providing information at the immediate scene. It was expected that the media would be used for wider dissemination of official messages:

“The police will be responsible for the flow of information, however, before they arrive, the fire brigade will be doing that” (GR4, R3)

“Mass media should be obliged to for the sake of the safety of the citizens, in particular situations, to inform the public of the situation, as the megaphone announcement made in a police car applies to only one street. And there is a
hundred of streets. It may be far too late before the police car appears everywhere" (GR3, R1)

At Stage 3, there was continued discussion about the need to inform the public about evacuation plans or provide information about sheltering. The preferred message style remained short, non-complex, practical instructions about what the public should do:

“Give them basic instructions, which cannot be too complex. Otherwise, the effect will be similar to a commercial for some medicine. People remember only the second part of it, as the medicine is harmful. In the case of complex instructions people do not know what to do. They need to be short and clear. Close the windows and not leave the house. The same applies to cars. The shorter the better” (GR3, R4)

Several participants also mentioned in written responses that the public should be explicitly told to follow instructions from the emergency services:

“Information about the type of danger - chlorine; the way the chlorine cloud is moving; the need to stay in flats; closing doors and windows till the arrival of the rescue services; staying in cars (internal air circulation); going to a safe zone; undergoing the evacuation process; unquestioningly obeying the orders given by the policing service” (GR2, R3, written response)

It was also suggested at this stage that parents should be told where and when they will be able to collect their children:

“Where to get medical help, where to evacuate (evacuation routes), how to behave; where to find out information about the casualties (announce that the children at school are safe), or tell parents where and when they can collect their children” (GR1, R1, written response)

The ongoing assumption of the potential for panic, led to the continued suggestion that unpalatable information should be withheld from the public:

“Our chemical unit was taught not to inform people about possible danger, about things that may happen... we cannot tell them something has gone wrong and they must run in panic” (GR4, R3)

At this stage, the media were still described as an important source of information for the public. There was also continued concern about the efficacy of public announcement and siren systems. It was suggested that police using megaphones would be used to provide instructions to the public in the immediate area. It was also suggested in Focus Group 4 that police psychologists and negotiators may be used to persuade crowds to comply with evacuation commands:

R2: Firemen or policemen can’t convince people.

R3: But the negotiator will choose the leader who will be in a position to influence a big group and lead them out without difficulty.
At Stage 4a, in response to media speculation about the possibility of terrorism, there was an expectation this suggestion would be denied:

“In other words, the news are disclaimed at the previous stage. We do not want to create panic. The fact that there are somebody saw something... there were three people and each of them might have seen something different” (GR3, R4)

“Assure that the situation is under control; repeat the safety announcements; assure that the event is not a terrorist activity; encourage to listen to the radio and TV announcements” (GR3, R1, written response)

It was also suggested had the witnesses approached the emergency services rather than the media that this information would not have been released to the public:

“If they reported it to the mass media, which would shower them with questions, then it would be a leak of information. However, if they came forward as witnesses to the fire fighters or the police officers, and admitted to have seen the driver turn the lorry deliberately, the police would interrogate them, and the spokesman would definitely not reveal it. Not at this stage” (GR1, R3)

“And we have to make sure that the information about the three witnesses is not going to leak.” (GR1, R4)

At this stage discussion about public messaging mostly continued to focus on providing safety instructions and repetition of previous advice. There was some discussion about disseminating information to the public about avoiding non-optimal behaviours. For example, participants in Focus Group 2 talked about communicating the need to use hotlines rather than contacting emergency services directly for information about the event:

**R1:** But people will call the fire brigade, the police, and the medical service, but not the emergency centre’s telephone number.

**R2:** That's why, the information needs to be released by the mass media as well. A telephone number and a request not to tie up the lines, as it occurs repeatedly.

**R3:** And another request, not to engage the emergency ambulance service, when it is redundant. The number of viewers is enormous, so those who do not need to make a phone call should be requested to go to the hospitals on their own.

Public information sources were consistent with those identified at Stage 3, including radio and TV announcements, an emergency hotline and police loud speaker announcements for local residents.

At Stage 4b it was suggested that parents need to be reassured their children are safe and should be directed to where they have been evacuated and away from the school:

“The television should be informed because of the children who will be collected from the school. You must have answered the same. And of course, the news
broadcast should be reassuring. They need to know that their children are safe” (GR1, R1)

“The managing director will make an announcement on TV stating that “The children are safe. There is no cause for worry”. He will certainly not say that the children have been poisoned, because we would be finished... The point is to assure them that the children are safe, that the evacuation is taking place, and refer them to the sports hall, instead of the school, which is in the area threatened with the hazard” (GR1, R3)

Messages continued to focus on what the public should do and where they could find further information, as well as discouraging people from unnecessarily attending hospitals. Again the information provided to the media for dissemination was described in the form of instructions and there was a focus on keeping messages short and basic:

“Generally speaking, in practice, people need to be given the most basic information. The scarcer and less complex the announcement the better. Short. For example each of them should be reduced to minimum. Why? First of all, it's because it will not bring any effects otherwise. Complex information or detailed explanation will not be understood by people. They will understand it but only after the situation has been handled and it is all over” (GR3, R4)

At this stage, it was suggested that emergency services should provide a spokesperson to communicate with the public via the media:

“And the information passed on to people through a kind of ‘telltale head’, through the media, would play a vital role as well. There is a difference between Mr Kamil Durczok (a journalist from TVN) who is reporting to have heard something somewhere and a nice-looking man, captioned as the director, the head of..., or somebody like that... from the fire department, for example. A person using technical language, which is certain to appeal to people” (GR1, R2)

There was also further discussion about the use of police psychologists and mediators in the immediate area to reassure the public that fire fighters had the situation under control. The possibility for recorded messages to offset difficulties with dealing with perceived lack of public compliance was also reiterated:

“That's why it is advisable to make an impersonal recording beforehand and replay it over and over. “It is not me who is telling you that. It's the machine. I'm sorry, Sir.” There is no personal interaction. No deal is being made. “I can't do anything here. It's the machine that is giving orders”.” (GR3, R1)

At Stage 5 there was further discussion about how to deal with lack of compliance, both in terms of encouraging people to contact their GP if they were experiencing respiratory problems rather than turning up at the local hospital and in relation to enhancing compliance at the incident scene. For the latter, it was suggested that short, decisive orders should be used to deal with curious onlookers:
"If there is this danger zone, you give a short order. You must be decisive. “Leave!” That’s it“ (GR4, R3)

At this stage there was further discussion about the use of an emergency contact number, as well as using the media to disseminate information to the wider public.

5.3.5 Existing media communication strategies

There was an assumption this type of incident would generate a lot of media interest. This was based on ongoing media interest in this type of news event:

“I don’t know how it is in the case of fire fighters, but we [the police] are receiving calls round-the-clock. Journalists call us every three or four hours asking if anything interesting has happened, something interesting, at least a fatal accident. So in this case, if two police cars with the sirens on are on their way, we are showered with calls. It proves that journalists are extremely alert and it will be impossible to keep this information in secret. They will be calling us shortly after the very explosion“ (GR2, R1)

It was also based on the expectation that this particular incident would provide dramatic images that would appeal to the media:

“TVN is regional as well. So we could see the pictures of the smoke over the city, taken half an hour ago. Even if not taken on the spot, they would have been taken from a building situated in the close neighbourhood of the chlorine tanker lorry. The shots would be perfect“ (GR2, R3)

As well as directly contacting the police for information, the media were expected to gain information through illegally monitoring emergency service communications:

“They will know right away that an emergency has taken place, because, if truth be told, the frequencies of the fire fighters and the police are tapped. Journalists do it illegally, but they do. They listen out and this way they get information about the events. So the information about this emergency will appear on the radio after two or three minutes“ (GR2, R2)

The media were also expected to obtain information directly from the public:

“The complexity of the situation depends on the scale of the accident. It is very often the case that there is an individual who is very likely to call the police, the fire brigade and other emergency services. He will also take some photographs, call TVN (a well-known Polish television channel) or get in touch with a journalist“ (GR1, R2)

“Radio ZET provides a hotline. You call there and everybody knows” (GR4, R2)

Consequently participants believed that the media would be on the scene very quickly. For example, in Focus Group 2:

**R2:** TVN24 will arrive at the scene of the accident in ten minutes. That’s for sure.
**R1:** So will other channels.

**R2:** Yes, that's true. And in an hour at the latest, the TVN24 Blue Helicopter will appear as well.

The media were primarily described in negative terms:

“Mass media. We do not want to declare anything because they will try to get in touch with us immediately. There are no mass media with us, it is not positive... media want to reveal a wealth of information as soon as possible” (GR1, R3)

“And the media... They are so powerful now... They are everywhere and they don't obey the law. They'll do whatever they can to film the scene to take a photo in order to broadcast” (GR4, R2)

From an emergency responder perspective it was not considered a priority to provide information to the media in the early stages of an incident:

“Telling media that we'll pass on the information later, because, above all, we have to organize our work, since saving people's lives and providing good road access are of utmost importance. And the media will manage to deliver the news. Journalists are not of top priority for us at that time. The press spokesmen are doing their best to inform the society... about the chemical hazard. So as far as the chemical and terrorist hazards are concerned, we should cut the media off. I think that the same applies to the fire fighters. You need to cut the media off. The first minutes are only at our disposal” (GR1, R4)

It was noted that the police are not allowed to deny there has been an incident to the media, but it was suggested they would be likely to just give basic information:

“Well, there is a spokesman, but, in the eyes of the law, a policeman cannot refuse to give information to a mass media representative. But the information he reveals is basic. So he may say that there been an accident and it poses a threat. While he won't give any details. That's the role of a spokesman. So the policeman cannot say "I'm sorry, I can't tell you that". He will admit that there has been an accident” (GR3, R4)

It was also suggested that the media should be removed from the incident scene to prevent them from accessing images that would be selected to exaggerate the negative impact of the incident:

“What's more, they need to be taken out of site. It is sometimes the case that they are making some strange shots. An individual caught during evacuation which may not necessarily be connected with the explosion, I don't know... A person who fell over, twisted his arm, cut himself or is covered in blood will be presented by media as one of the victims of the explosion. When, in fact, the person did not get hurt in the accident but, let's say, he cut himself when shaving in the morning. We are trying to steer clear of media. Later our spokesman or the commanding officer will make an official announcement” (GR1, R3)
Despite this reticence to engage with the media, it was recognised that radio and TV broadcasts are likely to play an important role in disseminating information about this type of incident:

“Cars and offices. That's where people are likely to listen to the radio. And I would opt for relying mainly on the radio stations. The radio announcers seem to find it easy to announce things like this. They are good at it. All the radio stations” (GR1, R4)

The media would therefore be directly asked to broadcast information about the incident. However it was also noted that there was no legal imperative for commercial stations to broadcast this type of information:

“Mass media are going to be present at the scene. Radio and television. The problem is that there are no regulations on making a commercial radio station broadcast a warning or the information. Nevertheless, hardly any of these stations is able to refrain from broadcasting the latest news. It is said that the best way to cause panic is to broadcast an interview with a fire fighter who is saying that there is no reason to panic (laughter)” (GR3, R1)

Some concerns were expressed about how helpful the media would be in this matter:

“To make matters worse, we are reaching a point at which we require some help from the journalists, in passing information out to people in the city, such as diversions, assembly points, first-aid posts, where they can meet... or information centres. At this point the journalists turn their back on us. When we need their help, get some data about the casualties, they are too busy. Fortunately, this situation is gradually changing, but at a very slow pace” (GR1, R3)

However, it was also suggested that the media would be likely to be co-operative in the early stages of an incident, although there was an expectation they would be less helpful as events progressed:

“I think that they can broadcast the basic information, the fact that such an emergency is taking place, that people are asked to avoid this area, this particular road and the crossroads. They will not publicize it too much. It is happening too quickly. They will not make a scandal over it now. However, when it is all over, they will. Award orders, lynch people in the newspapers and do other things. But during the very emergency they are not likely to cause any sensation” (GR2, R2)

Each institution was described as having their own media spokesperson and it was suggested that city and regional crisis centres would usually be responsible for liaising with the media:

“In reality nobody from the operation officers will talk to the media. Each institution has its own spokesman, who is responsible for media relations. Furthermore, the city and regional crisis centres usually handle the calls from the media. It's their duty to inform the former about the catastrophic events.
They have got their spokesmen there. They obviously rely on the information obtained from us” (GR1, R1)

It was suggested that the WCZK (Safety and Emergency Department) would play a key role in providing the media with information to disseminate to the public. There was an expectation that the media would be looking for high-ranking responders to interview and would have a tendency to exaggerate. It was therefore considered important to have an unflappable spokesperson to communicate with the media:

“First of all we need an open-minded spokesman. He must control himself and report things right. If we feel stressed because something’s going on, we may say something stupid, especially when a reporter comes up with a microphone. Journalists are very nosey” (GR4, R2)

There were mixed opinions regarding the quality of media reporting of this type of event, although the majority expected sensationalist coverage. This led to concern that the media may provide inaccurate versions of events or disclose information that would be better kept out of the public domain:

“There have been cases when too much information resulted in serious consequences. The media have a tendency to exaggerate” (GR4, R3)

The following discussion in Focus Group 1 illustrates key concerns that were raised about the consequences of sensationalist media reporting:

R1: People believe in the image created by the media. As you [addressing 2] said, the media can present the situation in a way that people will believe in what we are saying, or they (the media) will try to make an issue of it, as a part of sensational journalism, showing our colleague talking about no danger, and in the background there will be a crowd of people running away, and an enormous black cloud of smoke. It would certainly undermine his authority, wouldn’t it?

R3: Or the presented material is sometimes cut into pieces and some bits of the information are not broadcast at all.

R4: Just to give an example, do you [addressing 3] remember what he said about the hostel that burned down last year. The fire took a heavy death toll then. In an hour, the media made the fire service the sole culprit of this accident. So the spokesmen stopped passing out any information concerning the perils, as it appeared to be pointless.

R1: I couldn’t agree more.

R4: We perform all our duties, beginning with the provincial governor in this city. The created image of the fire service led to losing trust. So it was senseless to reveal any further information.

R3: There were a few people who walked outside, the citizens, sometimes even the intoxicated ones. The people living there were from different social backgrounds. And there was a drunk man shouting... So later, the
media presented a picture of these particular people and their tragedy, not the real events, which were described by the spokesman or the commanding officer. But it, this is also...

However there was also some recognition of the positive role that the media can play:

“But there are also some journalists who speak in favour of our actions. They show understanding of the problem” (GR1, R4)

“So journalists play both a positive and a negative role. Initially, their role is vital, since they are often the first to have access to information. So they are likely to say what is happening. However, later things take their own turn of events and this matter seems to be getting of our control” (GR1, R2)

5.3.6 Summary of Polish focus group results

With regards to overall emergency response capabilities, Polish focus group participants demonstrated a clear awareness of the key players/stakeholders and their responsibilities and roles, as well as established procedure. At Stage 1, participants focused primarily on planning permissions and risk assessment, issues that were considered to be well-regulated. Despite expressing confidence in these systems, it was felt that some industries would choose to pay fines rather than comply with regulations. At Stage 2, participants emphasised the need for evacuation and the importance of securing the scene, although a number of participants concluded there may be no time to evacuate and suggested instead that local residents should be advised to shelter and await further instructions. The fire services were expected to take control of the incident site, unless it was a suspected terrorist attack, in which case the police would fulfil this role. However it was thought unlikely there would be a terrorist attack in Poland, due to lack of perceived motivation or precedent. At Stage 3, participants focused on whether to evacuate or instruct people to stay indoors, with evacuation considered the preferred option if possible, especially evacuation of the school. The primary role of fire fighters was reiterated and the importance of setting up a triage area immediately outside the danger zone was also emphasised. The logistical difficulties of the situation were discussed, including concerns over the need for specialist equipment, the treatment of mass casualties and the ability of local hospitals to cope. Speculation that the incident was a terrorist attack at Stage 4a had little impact on the immediate emergency response and the tendency to assume it was not a terrorist incident persisted. Meanwhile, participants engaged in further discussion about evacuation plans and procedures. An emergency management team was expected to be properly formed by Stage 4b. At Stage 5, it was expect that roads would be re-opened, but the immediate incident site would remain cordoned off for inspection and investigation. Overall, there were mixed perceptions regarding health responders’ preparedness for this type of incident. Those who felt
unprepared attributed this to the unpredictability of events, lack of experience, limited resources, inadequate legislation, and a lack of cooperation between different emergency response organisations. Those who were positive about their capabilities suggested that co-operation between different agencies was improving year on year, that practice drills had improved skills and that funding had been increased, enabling more effective responses.

There were no references to **health responders' information needs or sources** at Stage 1. At Stage 2, participants were keen to know the exact contents of the lorry and the plume. This information was expected to be displayed on the side of the tanker and communicated to the police by chemical experts affiliated with the fire services. Information needs then shifted to determining the scale of the problem. The importance of knowing if the first responders on the scene were adequately prepared was also highlighted. Fire and ambulance services were expected to communicate with each other whenever there was an incident, though some respondents expressed concerns about the general quality of communication during the early stages of an incident. At Stage 3, information needs continued to focus on establishing the scale of the incident. Computer models, the tanker driver, chemical experts from local universities, and safety staff at the chemical plant were seen as viable sources of information for determining this information. The conversation also moved on to enabling a decision about evacuation. Finally, the need for good communication between ambulances and hospitals was emphasised as a number of problems were identified in existing interactions. At Stage 4a, it was suggested if it were a suspected terrorist incident that further information would be required about the driver of the chemical tanker. If the witnesses were believed, it was expected the Internal Security Agency would be informed and would be able to verify whether it was a terrorist event. At this stage there was further discussion about the need for information about the plume and spread of the incident, which persisted at Stage 4b. The fire services were seen as the primary source for this information. At Stage 5 there was further discussion about the importance of good communication between responding organisations, both in terms of obtaining the information required for effective on-site response and in co-ordinating the medical response at hospitals.

With regards to **public response to the incident**, the primary expectation across all stages was that the Polish public would be likely to be non-compliant and may have a tendency to panic. At Stage 1, there were differences of opinion regarding public responses to the news about the opening of the shopping centre. Some participants expected public complaint and protests, whereas others felt it would be unlikely there would be much public response. At Stage 2, there was an expectation that it would be difficult to persuade the public to comply
with instructions to evacuate. The public were frequently characterised as generally disinclined to comply with requests made by emergency services, which was associated with a very relaxed response to emergency situations. However, an expectation of potential panic co-existed with this characterisation. A lack of public compliance during evacuations continued to be a key topic at Stage 3. This included discussion about wider issues with lack of compliance such as the public refusal to allow emergency response vehicles to pass. Discussions about the possibility of panic continued to be raised and there was also an expectation there may be some general civil disobedience. At Stage 4a the speculation this was a terrorist event was perceived as having the potential to cause panic amongst the general public. However, it was expected that the public would not assume it was a terrorist event, as the probability of an attack in Poland was perceived to be very low. At Stage 4b there was an expectation that parents would try to collect children. There was also discussion about the tendency for people to want to travel to the area out of curiosity, as well as further discussion about the perception that the public would tend to ignore instructions provided by emergency services. At Stage 5, there was further discussion about non-optimal public responses, including ongoing concern about the lack of public response to emergency situations, as well as further speculation about the possibility of a panic response. In spite of the repeated focus on lack of compliance, it was suggested that the public may well pull together in the event of a real emergency. When asked about public trust in responders, fire fighters were characterised as the most trusted and therefore best placed to encourage people to evacuate if necessary. There was also an expectation of higher levels of compliance in response to uniformed emergency responders. When asked about the public’s ability to respond to this type of incident, the majority felt the public are not well prepared for such events.

There were no references to public communication strategies at Stage 1. At Stage 2, the majority of participants focused on the need to provide brief factual information to the general public. The primary aim of information provision for members of the public in the immediate area was to let them know whether they should shelter or evacuate. Some participants also felt that the public should be provided with information about risk levels, in relation to health and property. Others suggested that unpalatable information should be withheld from the public. Methods of communication discussed at Stage 2 included the use of the public-address system in the shopping centre. There was also some discussion about the use of public announcement equipment in emergency vehicles, but it was suggested there would be some reluctance to use this equipment due to lack of training and the poor sound quality. The police were described as playing the primary role in providing information at the immediate scene and it was expected that the media would be used for wider
dissemination of official messages. At Stage 3, there was continued discussion about the need to inform the public about evacuation plans or provide information about sheltering. The preferred message style remained short, non-complex, practical instructions about what the public should do. Several participants also mentioned in written responses that the public should be explicitly told to follow instructions from the emergency services. The ongoing assumption of the potential for panic led to the continued suggestion that unpalatable information should be withheld from the public. At Stage 4a, it was expected that media speculation about the possibility of terrorism would be denied. It was also suggested that the witnesses approached the emergency services rather than the media, this information would not have been released to the public. At this stage discussion about public messaging mostly continued to focus on providing safety instructions and repetition of previous advice. There was some discussion about disseminating information to the public about avoiding non-optimal behaviours. Public information sources were consistent with those identified at Stage 2, including radio and TV announcements, an emergency hotline and police loud speaker announcements for local residents. At Stage 4b it was suggested that parents need to be reassured their children are safe and should be directed away from the school to where they have been evacuated. Messages continued to focus on what the public should do and where they could find further information, as well as discouraging people from unnecessarily attending hospitals. Again the information provided to the media for dissemination was described in the form of instructions and there was a focus on keeping messages short and basic. At this stage, it was suggested that emergency services should provide a spokesperson to communicate with the public via the media. There was also discussion about the use of police psychologists and mediators to deal with the public at the incident scene. The possibility for recorded messages to offset difficulties with dealing with perceived lack of public compliance was also suggested. At Stage 5 there was further discussion about ways to deal with lack of compliance. It was suggested that short, decisive orders should be used to deal with curious onlookers.

There was an assumption this type of incident would generate a lot of media interest and provide dramatic images. The media were primarily described in negative terms. They were expected to obtain information through directly contacting the police for information, illegally monitoring emergency service communications, as well as from engagement with members of the public. Consequently, participants believed that the media would be on the scene very quickly, though emergency responders did not consider the provision of information to the media to be a priority in the early stages of an incident. Instead, the police were expected to provide minimum required information. Some respondents believed that the media should be removed from the incident scene to prevent them from accessing images that would be
selected to exaggerate the negative impact of the incident. Despite this reticence to engage with the media, it was recognised that radio and TV broadcasts are likely to play an important role in disseminating information about this type of incident. As a result, the media would be directly asked to broadcast information about the incident. However it was also noted that there was no legal imperative for commercial stations to broadcast this type of information. Overall, it was suggested that the media would be likely to be co-operative in the early stages of an incident, although there was an expectation they would be less helpful as events progressed. There were mixed opinions regarding the quality of media reporting of this type of event, although the majority expected sensationalist coverage. This led to concern that the media may provide inaccurate versions of events or disclose information that would be better kept out of the public domain.

5.4 Qualitative differences between UK and Polish focus group results

5.4.1 The emergency response

Both UK and Polish focus group participants demonstrated a good awareness of the key players and stakeholders, their roles, responsibilities and established emergency response procedures. Key similarities in the expected immediate response to the chemical incident scenario included the expectation that fire services would play a primary role in responding to the incident, police would focus on controlling the cordoned area, and that members of the public in the immediate area would be informed either to evacuate or to shelter and await further advice. Concerns were expressed in both countries about potential difficulties with dealing with mass casualties. Although procedures were broadly similar between countries there were some key differences. For example, in the UK, HART medical teams would go into the red zone to deal with the injured, whereas in Poland fire rescue teams would retrieve the injured and take them outside the immediate danger zone to be treated by ambulance services. Furthermore, although plans to evacuate or shelter were broadly similar across countries, there seemed a greater preference to evacuate in Poland. There were also some differences in the personnel expected to be involved with such an incident, for example volunteer fire services would be used in Poland, as would police psychologists and moderators but not in the UK. The suggestion that it might have been a terrorist incident was expected to have little impact on the immediate emergency response in either country, although it would trigger a police investigation in the UK and an Internal Security Agency investigation in Poland. The key difference in the response to this news was that Polish participants were disinclined to believe the suggestion it had been a terrorist attack due to lack of precedent or perceived motive, whereas UK participants were more ready to accept it
could have been a terrorist incident. Overall, UK participants were generally more confident about their response capabilities, although emergency responders in both countries were described as performing practice drills, and some individuals in Polish focus groups also felt confident this had prepared them to deal with this type of event.

5.4.2 Health responders’ information needs

The content of desired information was very similar across countries, with participants in both countries focusing on the need for more detailed information about the nature and the spread of the plume, and a shared expectation that this information would be provided by chemical experts and meteorologists. Participants in both countries also pointed out there would be useful information displayed on the side of the chemical tanker, and that the chemical plant would also be an important source of information about the contents of the tanker. Participants in both countries wanted to know whether they should be advising the public to shelter or evacuate, and both expected that a strategic command centre would be set up to co-ordinate their plans. There was also a shared emphasis regarding the importance of good inter-agency communication, although more concerns were expressed by Polish focus group participants regarding the quality of existing communication networks. There was a particular focus in UK focus groups on the provision of timely and consistent information to all emergency responders.

5.4.3 Expected public response

There were notable differences in the expected public response to the incident in UK and Polish focus groups. Polish focus group participants voiced a number of concerns about the likelihood of public compliance with official advice, with a particular focus on the difficulty in persuading members of the public to evacuate if required. In contrast, UK focus group participants expected the public to be largely compliant in response to instructions to evacuate, although participants in both countries expected parents would try to collect their children from school regardless of official advice to the contrary. There was also an expectation in both countries that the ‘worried well’ could place an extra burden on hospitals and health responders. There was a shared expectation that compliance could be enhanced if instructions were issued by emergency responders in uniform. There was some expectation of a panic response in both countries, although this was contradicted in Polish focus groups by repeated descriptions of a Polish public inclination to curiosity and desire to move towards danger rather than away from it. Participants in both countries assumed the suggestion it could have been a terrorist event may potentially increase the likelihood of a
panic response, but Polish participants felt it very unlikely the Polish public would assume it was a terrorist attack. Polish focus group participants suggested the public may be concerned about the safety of their property if they were to evacuate and also felt there was a potential for civil disobedience and looting following this type of event. However, there was no equivalent suggestion in UK focus groups. In the UK there was some discussion in later stages of the scenario with respect to dealing with an expected public desire to apportion blame for the event. This did not appear in Polish focus groups. Participants in both countries believed the public would not be particularly well prepared for this type of event.

5.4.4 Existing public communication strategies

There were a number of similarities in public communication strategies in each country. For example, participants in both countries considered it primarily the role of the police to communicate with the public at the incident site and there was an expectation in both countries that the media (in particular local radio stations) would be used to communicate with the wider public. There were also similarities in the broad content of communications. For example, participants in both countries focused on the need to provide the public with simple, practical advice about what they should (or should not) do in response to the incident. However, there were some important differences in public communication strategies between countries. Far more emphasis was placed on the need for reassurance in UK focus groups, although participants in both countries suggested that parents would need to be reassured their children were safe following the inject at Stage 4b. Polish focus group participants also advocated withholding unpalatable information from the public and indicated they would deny any suggestion it could have been a terrorist incident, which was not the case in UK focus groups. There was a greater emphasis in UK focus groups on the need to provide consistent multi-agency messages to the public, although participants in both countries recognised the importance of using a credible spokesperson. There was also greater emphasis in UK focus groups on the need to communicate that emergency responders had the situation under control. Information sources were very similar, although Polish focus group participants also suggested that psychologists and priests may be used for communicating with crowds in immediate area, which would not happen in the UK. Overall UK participants were more confident in their communication strategies, although it was suggested there may be some disagreement amongst different government departments and emergency response agencies regarding the amount of information that should be shared with the general public.
5.4.5 Existing media communication strategies

There were some key similarities in perceptions about media coverage of this type of incident, with participants in both countries suggesting the media would be likely to find out about the incident at a very early stage and a shared expectation that the media would be very interested in this type of event due to its potential for providing dramatic pictures. Furthermore there was a majority expectation in both countries that the media would be likely to report the incident in a sensationalist style. Despite expressing concerns about this tendency, participants in both countries recognised the importance of engaging with the media for the purposes of communicating information to the public, and participants in both countries indicated they would use mainstream media, in particular local radio for public communications. Consequently emergency responders in both countries were described as having designated media spokespersons, although there was more emphasis in UK focus groups on inter-agency media strategies. There were, however, also some important differences in media strategies between countries. UK participants described a clear strategy for developing and managing media relationships, which included early provision of information, regular and reliable updates and an emphasis on providing accurate information. In contrast, Polish focus group participants demonstrated reticence with regards to working with the media, indicating they would withhold information where possible and provide only minimum required information. UK participants indicated, where possible, they would allow full media access, and if this was not possible provide the media with a good reason for their actions, whereas Polish participants indicated they would try to prevent the media from accessing the incident site. In response to speculation about terrorism UK participants felt it would be unhelpful to make a statement to the media to confirm the rumour and expected to reiterate the message regarding ongoing investigations instead. In contrast, Polish focus group participants suggested they would directly deny the rumour. Overall UK participants exhibited greater confidence in their relationship with the media and the effectiveness of media strategies.

5.5 Focus group discussion

A comparison of UK and Polish focus groups revealed some shared features in expected emergency response and public communication strategies, but also some important differences. Participants in both countries believed that members of the public would be required to either shelter in place or evacuate the area in response to this scenario. Similar health responders’ information needs were expressed throughout the scenario and participants in both countries considered good inter-agency communication necessary for an
effective response. Some concerns were raised about the efficacy of current strategies for providing information to frontline responders, particularly in Polish focus groups. This is important as effective provision of information to first responders is likely to play a key role in determining the success of crisis and consequence management (Becker, 2004).

There was also a shared expectation that the public in both countries would not be particularly well prepared for this type of event and may have a propensity to panic. Participants in both countries also expected that parents would disregard official advice if it precluded the collection of children from school. However, despite these similarities, there was a notable difference in expectations regarding the response of members of the public directly involved in the incident. In the UK, participants generally felt that members of the public immediately involved in the incident would be willing to follow emergency responders’ instructions to shelter or evacuate. In contrast Polish focus group participants characterised the Polish public as generally unwilling to follow emergency responders’ instructions, particularly if this involved evacuation. If public behaviours are in line with these expectations, this will have important implications for the success of response plans which are reliant on public compliance with official instructions.

Focus group results suggest that some aspects of current communication practices are consistent with best practice identified in Section 3.7. For example, participants in both countries focused on providing the public with simple, practical advice and UK participants also identified the need for accurate and consistent information. This style of messaging conforms to recommendations for communication in public health emergencies (Wray et al, 2008). Participants in both countries also recognised the importance of using a credible source to communicate with the public, which is also consistent with recommended practice (Rogers et al, 2007). Much of the proposed content of messages would also satisfy key public information requirements identified by Henderson et al (2004), as focus group participants in both countries indicated they would provide information about protective actions and medical facts. However, not all recommendations for effective risk and crisis communication seem to have been incorporated into current practices. For example, there was no evidence to suggest that participants are aware of the benefits of making information locally relevant, that understanding may be increased through public consultation or that they had taken into consideration plural audiences for their messages (Rogers et al, 2007).

Furthermore, some non-optimal communication practices were identified in both countries. For example, there was a strong emphasis in UK focus groups on the need to provide reassurance to the public. This strategy was predicated on the assumption that there is a tendency for the public to panic, but extensive research evidence suggests this is unlikely to
be the case (Sheppard et al, 2006). Furthermore, information interventions that over-assure the public may reduce compliance with recommended health behaviours (Rogers et al, 2010). Consequently crisis communicators should be aware it is sometimes necessary to convince the public of a threat rather than provide reassurance (Rubin et al, 2009). Polish focus group participants indicated that unpalatable information may be withheld from the public. Again this strategy seemed motivated by the intention to avert panic, but is also unlikely to be a successful approach. Withholding information may in fact contribute to a public over-reaction and is likely to lead to a loss of trust which could have a severely detrimental effect on the likelihood of public compliance with recommended health behaviours (Sheppard et al, 2006). Moreover, if the Polish focus group participants’ characterisation of the Polish public as non-compliant is correct, their public communications should focus on tackling low uptake of recommended behaviours rather than averting panic.

Participants in both countries recognised the key role the media plays in disseminating information and framing public perceptions of events. However, concerns were expressed in both countries about the potential for media sensationalism and the provision of misinformation by the media. UK participants indicated they had responded to this tension by developing strategies aimed at establishing a partnership with the media. This included providing information to the media at the earliest opportunity during an event and regularly updating this information. The importance of providing the media with accurate information was also emphasised. This is consistent with recommended strategies for effective communication identified by Rogers et al (2007). In contrast, Polish focus group participants indicated they would try to minimise contact with the media and withhold information where possible. Evidence from events such as the radioactive incident in Goiania, Brazil suggest this is unlikely to be an effective approach and highlight the importance of developing partnerships with the media through regular engagement prior to a crisis (Stone, 2007).

In conclusion, focus groups results suggest that health responders in both countries are aware of the importance of good communication between agencies and with the public, and have already adopted some widely accepted principles of crisis communication in the style and content of public communications during an event. Perceptions of lack of public preparedness suggest there could be a need for improvements in pre-event messaging. These results also suggest the need for enhanced inter-agency communication. The misperception that panic is an inevitable public response to this scenario must be addressed and responders need to be aware of the potentially negative consequences of withholding

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13 Tension in relationships between crisis communicators and the media has been identified in a wide range of countries, including Canada (Lemyre et al, 2006), Brazil, Japan and the USA (Stone, 2007)
information from the public. These results suggest key differences in UK and Polish responders’ expectations regarding public responses to official instructions following a chemical incident emergency. If these perceived differences are reflected in public behavioural intentions this will have important implications for the development of country-specific guidance for communication.
6 SURVEY

This section of the report presents the results of an online survey conducted with members of the public in the UK and Poland to ascertain levels of trust and intended behavioural responses to existing emergency response plans and messages identified during the focus groups described in Section 5.

6.1 Survey introduction

As discussed in Section 5.5, our focus group findings suggest that current emergency response plans for CIEs require high levels of compliance with official advice, yet there is an expectation amongst UK and Polish responders that members of the public may not fully comply with instructions. In this study we used an online survey to examine whether public behavioural intentions were in line with health responders’ expectations and to explore factors that may enhance or reduce the likelihood of public compliance with official advice.

Although it is not fully understood why members of the public do or do not comply with official advice during a major chemical incident, a number of factors likely to influence behaviour have been identified. For example, studies of public responses to the 2002 outbreak of severe acute respiratory syndrome in Hong Kong found that beliefs about the efficacy of recommended behaviours, likelihood of personal impact, the severity of consequences, trust in the ability of authorities to control the situation and levels of anxiety may all have an impact on compliance with official advice (Lau et al, 2003; Tang and Wong, 2003, 2004). The role of trust in public uptake of official recommendations is well established (Rogers et al, 2007) and credibility of source information was found to play an important role in public intentions to comply with recommended actions following a hypothetical botulism attack (Glik et al 2008). Higher levels of anxiety were associated with behavioural change in response to the outbreak of severe acute respiratory syndrome in Hong Kong (Lau et al 2003) and low levels of anxiety were associated with limited behavioural changes in response to the Swine Flu outbreak in the UK (Rubin et al, 2009).

A potentially useful theoretical framework for understanding public responses to official advice during a CIE is Protection Motivation Theory (Rogers, 1975; Maddux and Rogers, 1983). Protection Motivation Theory (PMT) was originally developed as a model of preventative health behaviour to examine the effects of fear appeals on persuasion, but can be applied to any threat for which there is an effective recommended response (Floyd et al, 2000). According to PMT, the extent to which individuals are motivated to protect themselves from a health threat is influenced by two key factors; threat appraisal and coping appraisal. Threat appraisal involves assessing the severity of the threat and the personal risk involved,
as well as the emotional response associated with the threat (fear arousal). Coping appraisal consists of response efficacy, self-efficacy and response costs. Response efficacy is the belief that carrying out recommendations will be effective. Self-efficacy is the extent to which an individual believes they are capable of carrying out the recommendations. Response costs are the perceived costs of carrying out the recommendations.

Consequently, it is not just belief in the efficacy of adopting adaptive behaviours that is important, but an individual must believe him or herself to be capable of carrying out the recommended behaviours (Prentice-Dunn and Rogers, 1986). According to PMT, protective behaviours are more likely to be adopted when there are high levels of threat appraisal, when response efficacy and self-efficacy are also high and response costs are low (Floyd et al, 2000). Coping appraisal is typically seen as having a greater influence on behavioural intentions than threat appraisal (Milne et al, 2000; Ruiter et al, 2001). Recent research has provided support for PMT as a framework for understanding public intention to comply with government advice about pandemic flu (Teasdale et al, 2011). This research also supports the contention that coping appraisal has more influence than threat appraisal and found self efficacy to be the most important component of coping appraisal.

In this study we used an online survey to test the strength of association of threat and coping appraisals, anxiety, and trust in authorities with the intention to comply with official advice to stay in place and shelter. Surveys were based on the scenario used in the focus groups described above. Non-compliant outcomes were based on behavioural intentions identified in previous research studies. These include collecting children from school (Rubin et al, 2005), checking on family and friends (Rubin et al, 2005) and evacuation (Kasperson and Pijawka, 2005; Ziegler et al, 1981). Because previous authors have raised concerns about how the framing of an emergency message might affect public responses (Chief Medical Officer’s Statistical Legacy Group, 2010; Wiedemann and Schütz, 2005), in our survey, advice was presented in one of three ways, (1) with reassurance that the health threat was low, (2) with emphasis on the worst case scenario, or (3) with no additional information. In order to determine whether intention to comply would be influenced by ease of compliance, participants were asked about their behavioural intentions if the incident were to occur if they were at home or in a less convenient location. Two identical surveys were conducted, one in the UK and one in Poland. Each survey used conventional opinion poll methods to reach a demographically representative sample of the adult population of that country.
6.2 Survey design and methods

6.2.1 Design and participants
A 2x3 design was used to test the effect of ease of compliance (easy v effortful) and type of warning (reassurance v worst case v control) on intentions to carry out recommended behaviour following a chemical incident.

An online survey was conducted on our behalf by GMI (Global Market Insite UK Limited). Usable data were obtained from 601 participants in the UK and 602 participants in Poland. Data collection was carried out simultaneously in both countries between 3rd and 13th December 2010. Participants were drawn from the GMI United Kingdom and Poland panels (UK reach 315,432, Polish reach 45,213) to obtain a nationally representative sample for each country (based on sex and age). Participants who completed the survey in less than 35% of the median time were excluded from the sample. Participants who completed the survey were compensated for their time using a points-based system, in which panel members accumulate points that can be exchanged for cash.

In line with the King’s College London ethics approval procedures (ethics approval code: REP(WSG)/09/10-3), the anonymity of each participant was maintained. Prior to completing the survey, each participant was presented with an online consent form. This informed participants of their right to withdraw from the study, provided information about anonymity and data protection, and provided contact details for the researchers in case participants had any further questions after they had participated in the survey. Only participants who indicated they had read this information and were happy to take part in the study could proceed to the survey. No participants contacted the researchers for further information following the survey.

6.2.2 The survey
The CIE scenario developed for the focus groups (described in Section 5.1.3) was adapted for use in the survey. The scenario involved the collision of two tankers at a local petrol station, resulting in the release of chlorine gas. Participants were informed that the police had made a radio announcement, based on the advice of health experts, which asked all local residents to stay indoors with doors and windows closed for the next 8 hours. The advice to ‘stay indoors’ was based on information provided by focus group participants regarding the most likely advice that would be given to the public following this type of event. The period of time was selected to ensure it was long enough to pose potential inconvenience while remaining a feasible instruction.
Participants were randomised automatically to one of three conditions; (1) Reassurance, (2) Worst case scenario, or (3) Control. In the reassurance condition, participants were informed it was unlikely the cloud would cause any noticeable health effects, but they should stay inside as a precautionary measure. In the worst case scenario condition, participants were told that the cloud could cause severe health effects, and in the control condition they were simply advised to stay indoors (the full survey text appears in Appendix 4). The scenario was followed by a multiple-choice question which asked ‘which of these actions is the police official recommending?’ followed by three incorrect and one correct response. This was included to ensure that participants had fully read and understood the instructions provided. Participants who provided incorrect responses were screened out at this stage.

Those who provided a correct response went on to complete the survey. Questions were presented in a grid format, with the order of questions randomised within each. Participants were also asked to rate the extent to which they trusted government officials, local authorities and the three main emergency services. This was followed by a final screen which requested further demographic information.

The Polish version of the questionnaire was a direct translation of the English questionnaire. However, Polish participants were not asked about their ethnicity, as our Polish project partners indicated this is not usual practice in Poland. The definition of ‘the authorities’ for the trust measure was also changed to be locally appropriate.

6.2.3 Behavioural outcome measures
Participants were asked how likely they would be to perform five actions if the scenario were to occur (a) while they were at home, and (b) while they were at the local post office. Only one item followed official advice (‘stay inside your home/the post office’), the other items were ‘stay inside your home/the post office for some, but not all of the period’, ‘leave to check on vulnerable neighbours, family or friends/go home’, ‘collect your children from school or day-care’, and ‘leave the area’. Possible response options were ‘not at likely’ (coded as a score of 1), ‘not very likely’ (2), ‘fairly likely’ (3), ‘very likely’ (4), and ‘not applicable’ (coded as missing data).
6.2.4 Predictor variables

Three groups of predictor variables were measured; (1) anxiety, (2) threat and coping appraisal, and (3) trust in authorities.

Anxiety was measured using a six-item state anxiety scale derived from the State-Trait Anxiety Inventory (Marteau and Bekker, 1992; Tluczek, Henriques, and Brown, 2009). Participants were asked the extent to which they would feel each of the following emotions if this chemical incident occurred in their local area; ‘calm’, ‘tense’, ‘upset’, ‘relaxed’, ‘content’ and ‘worried’. Possible response items were ‘not at all’ (coded as a score of 1), ‘somewhat’ (2), ‘moderately’ (3), ‘very much’ (4), and ‘don’t know’ (coded as missing data).

Threat and coping appraisal were measured using six items adapted from Teasdale et al (2011). Perceived severity of threat was measured by asking whether participants thought it was likely they would become seriously ill if exposed to the chemicals released in this incident. Perceived likelihood of exposure was measured by asking participants about likelihood of personal exposure if they did not take preventative action. Emotional response was measured by asking participants if they would feel anxious about being exposed to the chemicals released in this incident. Response efficacy was measured by asking participants if they would be safe if they stayed indoors with windows and doors closed. Self efficacy was measured by asking participants if compliance to recommended practice would mean they would be unable to help people they care about. Appendix 4 shows the wording used for each item.

Trust in authorities was measured using five items adapted from Rubin et al (2009). ‘The authorities’ were defined as “the government, the NHS and other agencies such as the Health Protection Agency” for British participants and as “the government (at national and local level), the health care system, and Sanitary and Epidemiological Stations” for Polish participants. Participants were asked to rate the extent to which they felt ‘the authorities’ would do a good job, have sufficient resources and the necessary knowledge to respond to this incident. They were also asked whether they felt ‘the authorities’ would act in the public’s best interest when dealing with this incident and whether they felt ‘the authorities’ would be open and honest in their dealings with the public. PMT and Trust measures used a five-point response format. Possible options were ‘strongly disagree’ (coded as a score of 1), ‘tend to disagree’ (2), ‘neither agree nor disagree’ (3), ‘Tend to agree’ (4), and ‘strongly agree’ (5). Participants were also offered the option to give ‘no opinion’ (coded as missing data).
6.2.5 Demographic variables
Participants were asked their sex, age, ethnicity (UK only), highest educational qualification, occupation (and whether it was full or part time), whether they had any children (if so, how many and ages) and whether they had the use of a car. We also recorded whether they took part in the British or Polish survey.

6.2.6 Trust in authorities
In addition to measuring behavioural outcomes and predictor variables that may be associated with these responses, an additional question was included to measure trust in health responders. This question did not form part of the main analysis, but was included in order to provide feedback to health responders. Participants were provided with a list of possible sources for information following this type of chemical incident and asked how trustworthy they considered information from these sources. The sources they rated were, ‘government officials’, ‘local authorities’, ‘the police’, ‘fire services’ and ‘ambulance services’. Possible response options were ‘not at all trustworthy’ (coded as a score of 1), ‘not very trustworthy’ (2), ‘reasonably trustworthy’ (3), ‘very trustworthy’ (4), and ‘don’t know’ (coded as missing data).

6.2.7 Analyses
Behavioural outcome measures were re-coded into binary variables, with ‘not at all likely’ and ‘not very likely’ given a value of 0 (not likely), and ‘fairly likely’ and ‘very likely’ given a value of 1 (likely). In addition, participants were categorised as ‘fully compliant’ if they had a score of ‘likely’ for ‘Stay inside your home’ and ‘unlikely’ for all other behavioural outcomes. ‘No opinion’ and ‘don’t know’ responses were coded as missing data.

Chi squared tests were used to examine the associations between message presentation and behavioural intentions.

Cochran’s Q tests were employed to examine the association between ease of compliance and behavioural intentions.

Binary logistic regressions were used to test the association between perception variables and behavioural intentions, and between demographic variables and behavioural intentions.

T-tests and Chi squared tests were used to examine national differences in demographic features and perception variables. Adjusted odds ratios were calculated using binary logistic
regressions to examine national differences in behavioural intentions, controlling for
demographic and perception variables that were significantly different between countries.

6.3 Survey results

6.3.1 Sample characteristics
The online survey was completed by 1203 participants. Of these, 400 (33.3%) were in the
control group, 402 (33.4%) were in the reassurance group, and 401 (33.3%) were in the
worst case group. Sample characteristics are show in Table 6.1.

Table 6.1: Sample Characteristics

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>Frequency (%) of the sample n</th>
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<tbody>
<tr>
<td>Sex (n=1203)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>605 (50.3)</td>
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<tr>
<td>Female</td>
<td>598 (49.7)</td>
</tr>
<tr>
<td>Age (n=1203)</td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>244 (20.3)</td>
</tr>
<tr>
<td>25-44</td>
<td>497 (41.3)</td>
</tr>
<tr>
<td>45-65</td>
<td>462 (38.4)</td>
</tr>
<tr>
<td>Country (n=1203)</td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>601 (50.0)</td>
</tr>
<tr>
<td>Poland</td>
<td>602 (50.0)</td>
</tr>
<tr>
<td>Ethnicity (n=1203)</td>
<td></td>
</tr>
<tr>
<td>White or Polish</td>
<td>1152 (95.8)</td>
</tr>
<tr>
<td>Ethnic minority</td>
<td>40 (3.3%)</td>
</tr>
<tr>
<td>Education (n=1139*)</td>
<td></td>
</tr>
<tr>
<td>GCSE or equivalent</td>
<td>399 (35.0)</td>
</tr>
<tr>
<td>A level or equivalent</td>
<td>246 (21.6)</td>
</tr>
<tr>
<td>Degree or higher</td>
<td>494 (43.4)</td>
</tr>
<tr>
<td>Occupation (n=1185*)</td>
<td></td>
</tr>
<tr>
<td>Not Working</td>
<td>384 (32.4)</td>
</tr>
<tr>
<td>Working</td>
<td>801 (67.6)</td>
</tr>
<tr>
<td>Children (n=1203)</td>
<td></td>
</tr>
<tr>
<td>School age children</td>
<td>442 (36.7)</td>
</tr>
<tr>
<td>Children not of school age</td>
<td>199 (16.5)</td>
</tr>
<tr>
<td>No children</td>
<td>562 (46.7)</td>
</tr>
<tr>
<td>Use of a car? (n=1203)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>889 (73.9)</td>
</tr>
<tr>
<td>No</td>
<td>314 (26.1)</td>
</tr>
</tbody>
</table>

*n <1203 due to missing data
6.3.2 Association between ease of compliance and behavioural intentions

Table 6.2 shows responses provided by participants for each of the behavioural reactions for the home scenario and the post office scenario.

Table 6.2: Frequencies (percentages) for behavioural intentions according to location

<table>
<thead>
<tr>
<th>Behavioural Intention</th>
<th>Ease of compliance</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At home</td>
<td>In post office</td>
</tr>
<tr>
<td>Stay inside:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>72 (6.1)</td>
<td>602 (51.2)</td>
</tr>
<tr>
<td>Likely</td>
<td>1116 (93.9)</td>
<td>573 (48.8)</td>
</tr>
<tr>
<td>Stay inside for some but not entire period:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>459 (39.7)</td>
<td>571 (48.8)</td>
</tr>
<tr>
<td>Likely</td>
<td>696 (60.3)</td>
<td>598 (51.2)</td>
</tr>
<tr>
<td>Leave home to check others / Leave PO to go home:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>469 (41.2)</td>
<td>238 (20.3)</td>
</tr>
<tr>
<td>Likely</td>
<td>670 (58.8)</td>
<td>932 (79.7)</td>
</tr>
<tr>
<td>Leave the area:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>694 (60.5)</td>
<td>458 (39.6)</td>
</tr>
<tr>
<td>Likely</td>
<td>454 (39.5)</td>
<td>700 (60.4)</td>
</tr>
<tr>
<td>Collect children (parents of school children only):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>74 (20.4)</td>
<td>59 (16.5)</td>
</tr>
<tr>
<td>Likely</td>
<td>288 (79.6)</td>
<td>299 (83.5)</td>
</tr>
<tr>
<td>Fully compliant:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not compliant</td>
<td>900 (74.8)</td>
<td>1108 (92.1)</td>
</tr>
<tr>
<td>Compliant</td>
<td>300 (24.9)</td>
<td>89 (7.4)</td>
</tr>
</tbody>
</table>

Cochran’s Q tests indicated that ease of compliance had a significant effect on every behavioural outcome (all p values ≤0.02).

The most likely reaction in the home scenario was to ‘stay inside’, and significantly more participants said they would stay inside in the home scenario than in the post office scenario (Cochran’s Q = 491.81, p<0.0005). Conversely, participants indicated if the incident occurred while they were in the post office that their most likely reaction would be to head home.

Significantly more participants intended to ‘leave the area’ in the post office scenario than in the home scenario (Cochran’s Q=181.31, P<0.0005).
A large majority of participants with school aged children intended to collect their children, regardless of location, but significantly more intended to do so in the post office scenario (Cochran’s Q=5.83, p=0.02)

A minority of participants reported full compliance in either the home (24.9%) or the post office (7.4%) scenario, but significantly fewer intended to fully comply in the post office scenario than in the home scenario (Cochran’s Q=172.27, p,0.0005)

### 6.3.3 Association between message presentation and behavioural intentions

Table 6.3 shows responses provided by participants for each of the behavioural reactions for the home scenario for (a) the control group, (b) the reassurance group, and (c) the worst case scenario group.

<table>
<thead>
<tr>
<th>Behavioural intention</th>
<th>Message presentation (condition)</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stay inside:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>Control (n=400)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>23 (5.8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reassurance (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 (5.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worst case scenario (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>28 (7.1)</td>
<td></td>
</tr>
<tr>
<td>Likely</td>
<td>Control (n=400)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>376 (94.2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reassurance (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>373 (94.7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worst case scenario (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>367 (92.9)</td>
<td></td>
</tr>
<tr>
<td><strong>χ²</strong> = 1.16, p = 0.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stay inside for some but not entire period:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>Control (n=400)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>151 (39.2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reassurance (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>152 (39.4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worst case scenario (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>156 (40.6)</td>
<td></td>
</tr>
<tr>
<td>Likely</td>
<td>Control (n=400)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>234 (60.8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reassurance (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>234 (60.6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worst case scenario (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>228 (59.4)</td>
<td></td>
</tr>
<tr>
<td><strong>χ²</strong> = 0.19, p = 0.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Leave home to check on others:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>Control (n=400)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>163 (42.4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reassurance (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>148 (38.8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worst case scenario (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>158 (42.2)</td>
<td></td>
</tr>
<tr>
<td>Likely</td>
<td>Control (n=400)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>221 (57.6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reassurance (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>233 (61.2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worst case scenario (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>216 (57.8)</td>
<td></td>
</tr>
<tr>
<td><strong>χ²</strong> = 1.29, p = 0.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Leave the area:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>Control (n=400)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>242 (63.5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reassurance (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>223 (58.1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worst case scenario (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>229 (59.8)</td>
<td></td>
</tr>
<tr>
<td>Likely</td>
<td>Control (n=400)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>139 (36.5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reassurance (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>161 (41.9)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worst case scenario (n=401)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>154 (40.2)</td>
<td></td>
</tr>
<tr>
<td><strong>χ²</strong> = 2.48, p = 0.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Collect children (parents of school children only)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>Control (n=129)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>34 (26.2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reassurance (n=117)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 (18.1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worst case scenario (n=112)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19 (16.4)</td>
<td></td>
</tr>
<tr>
<td>Likely</td>
<td>Control (n=129)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>96 (73.8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reassurance (n=117)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>95 (81.9)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worst case scenario (n=112)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>97 (83.6)</td>
<td></td>
</tr>
<tr>
<td><strong>χ²</strong> = 4.18, p = 0.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fully compliant:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not compliant</td>
<td>Control (n=129)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>291 (72.6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reassurance (n=117)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>299 (74.8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worst case scenario (n=112)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>310 (77.1)</td>
<td></td>
</tr>
<tr>
<td>Compliant</td>
<td>Control (n=129)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>110 (27.4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reassurance (n=117)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100 (25.0)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worst case scenario (n=112)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>90 (22.4)</td>
<td></td>
</tr>
<tr>
<td><strong>χ²</strong> = 4.60, p = 0.33</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Parents only control n=129, reassurance n=117, worst case scenario = 112
Message presentation had no impact on behavioural intentions if the chemical incident occurred while participants were at home ($p>0.10$ for all behavioural outcomes).

Table 6.4 shows responses provided by participants for the post office scenario for (a) the control group, (b) the reassurance group, and (c) the worst case scenario group.

### Table 6.4: Frequencies (percentages) for behavioural intentions if at post office by condition

<table>
<thead>
<tr>
<th>Behavioural intention</th>
<th>Control (n=400)</th>
<th>Reassurance (n=401)</th>
<th>Worst case scenario (n=401)</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stay inside:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>195 (49.7)</td>
<td>211 (53.8)</td>
<td>196 (50.1)</td>
<td>$\chi^2 = 1.59, p = 0.45$</td>
</tr>
<tr>
<td>Likely</td>
<td>197 (40.3)</td>
<td>181 (46.2)</td>
<td>195 (49.9)</td>
<td></td>
</tr>
<tr>
<td><strong>Stay inside for some but not entire period:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>193 (49.4)</td>
<td>187 (47.9)</td>
<td>191 (49.2)</td>
<td>$\chi^2 = 0.19, p = 0.91$</td>
</tr>
<tr>
<td>Likely</td>
<td>198 (50.6)</td>
<td>203 (52.1)</td>
<td>197 (50.8)</td>
<td></td>
</tr>
<tr>
<td><strong>Leave post office to go home:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>82 (20.9)</td>
<td>66 (16.9)</td>
<td>90 (23.2)</td>
<td>$\chi^2 = 4.84, p = 0.09$</td>
</tr>
<tr>
<td>Likely</td>
<td>310 (79.1)</td>
<td>324 (83.1)</td>
<td>298 (76.8)</td>
<td></td>
</tr>
<tr>
<td><strong>Leave the area:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>167 (43.2)</td>
<td>146 (37.4)</td>
<td>145 (38.1)</td>
<td>$\chi^2 = 3.19, p = 0.20$</td>
</tr>
<tr>
<td>Likely</td>
<td>220 (56.8)</td>
<td>244 (62.6)</td>
<td>236 (61.9)</td>
<td></td>
</tr>
<tr>
<td><strong>Collect children</strong> (parents of school children only*):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>30 (23.3)</td>
<td>16 (13.7)</td>
<td>13 (11.6)</td>
<td>$\chi^2 = 6.9, p = 0.03$</td>
</tr>
<tr>
<td>Likely</td>
<td>99 (76.7)</td>
<td>101 (86.3)</td>
<td>99 (88.4)</td>
<td></td>
</tr>
<tr>
<td><strong>Fully compliant:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not compliant</td>
<td>372 (93.0)</td>
<td>375 (94.2)</td>
<td>361 (90.5)</td>
<td>$\chi^2 = 4.23, p = 0.51$</td>
</tr>
<tr>
<td>Compliant</td>
<td>28 (7.0)</td>
<td>23 (5.8)</td>
<td>38 (9.5)</td>
<td></td>
</tr>
</tbody>
</table>

*Parents only control n=129, reassurance n=117, worst case scenario = 112

Significantly more parents in the worst case scenario and reassurance conditions intended to collect their children from school than in the control group ($\chi^2 = 6.9, p=0.03$). Message presentation had no impact on any other behavioural intention.

### 6.3.4 Association between perception variables and behavioural intentions

Table 6.5 shows the associations between perception variables and behavioural intentions for the home scenario.
Table 6.5: Association between perception variables and behavioural intentions (if at home)

<table>
<thead>
<tr>
<th>Perception variables</th>
<th>Mean (SD)</th>
<th>Odds ratio (95% confidence interval) for behavioural intentions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stay inside</td>
<td>Stay inside for some but not entire period</td>
</tr>
<tr>
<td>Trust&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.46 (0.88)</td>
<td>1.33* (1.02-1.73)</td>
</tr>
<tr>
<td>Anxiety&lt;sup&gt;b&lt;/sup&gt;</td>
<td>19.34 (4.11)</td>
<td>1.01 (0.96-1.07)</td>
</tr>
<tr>
<td>Perceived severity&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.57 (1.11)</td>
<td>0.92 (0.74-1.15)</td>
</tr>
<tr>
<td>Perceived likelihood of exposure&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.80 (0.99)</td>
<td>1.11 (0.88-1.40)</td>
</tr>
<tr>
<td>Emotional response&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.06 (0.95)</td>
<td>0.91 (0.70-1.18)</td>
</tr>
<tr>
<td>Response efficacy&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.66 (1.02)</td>
<td>1.53** (1.23-1.90)</td>
</tr>
<tr>
<td>Self efficacy&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.11 (1.08)</td>
<td>1.73** (1.44-2.08)</td>
</tr>
<tr>
<td>Response costs&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.71 (1.10)</td>
<td>0.68** (0.53-0.88)</td>
</tr>
</tbody>
</table>

<sup>a</sup>Scores range from 1 (Strongly disagree) to 5 (Strongly agree)<br><sup>b</sup>Scores range from 0 (not at all anxious) to 24 (very anxious)<br>* Significant association at the 0.05 level<br>** Significant association at the 0.01 level

Higher levels of trust were associated with a greater likelihood of staying inside. Response efficacy and self efficacy were also positively associated with staying inside, whereas response costs were negatively associated with the intention to stay inside.

Anxiety was negatively associated with full compliance, as was perceived severity and emotional response. Higher levels of response efficacy and self efficacy were significantly associated with the intention to fully comply and response costs were negatively associated with this intention.

Lower levels of response efficacy and self efficacy and higher levels of response costs were significantly associated with non-compliant behaviours. Higher threat appraisals were significantly associated with the intention to leave home to check on others and leave the
area. Higher levels of anxiety were associated with all non-compliant behaviours, except for collecting children.

Table 6.6 shows the correlations between perception variables and behavioural intentions for the post office scenario.

Table 6.6: Association between perception variables and behavioural intentions (if at post office)

<table>
<thead>
<tr>
<th>Perception variables</th>
<th>Mean (SD)</th>
<th>Odds ratio (95% confidence interval) for behavioural intentions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Stay inside Stay inside for some but not entire period Leave post office to go home Leave area Collect children Collect children (parents only) Fully compliant</td>
</tr>
<tr>
<td>Trust*a</td>
<td>3.46 (0.88)</td>
<td>1.41** (1.23-1.61) 1.23** (1.08-1.41) 0.98 (0.84-1.16) 0.97 (0.85-1.11) 0.98 (0.71-1.36) 1.48** (1.13-1.93)</td>
</tr>
<tr>
<td>Anxiety*b</td>
<td>19.34 (4.11)</td>
<td>1.14** (1.10-1.18) 1.15** (1.11-1.18) 0.97 (0.94-1.01) 1.11** (1.08-1.15) 1.04 (0.97-1.12) 1.02 (0.96-1.08)</td>
</tr>
<tr>
<td>Perceived severity*a</td>
<td>3.57 (1.11)</td>
<td>1.59** (1.42-1.78) 1.42** (1.27-1.58) 0.81** (0.71-0.93) 1.31** (1.17-1.46) 0.83 (0.63-1.10) 1.29* (1.04-1.58)</td>
</tr>
<tr>
<td>Perceived likelihood of exposure*a</td>
<td>3.80 (0.99)</td>
<td>1.27** (1.13-1.43) 1.19** (1.06-1.34) 0.78** (0.66-0.91) 1.09 (0.97-1.23) 0.77 (0.56-1.07) 1.30* (1.02-1.65)</td>
</tr>
<tr>
<td>Emotional response*a</td>
<td>4.06 (0.95)</td>
<td>1.57** (1.37-1.79) 1.64** (1.44-1.88) 0.93 (0.80-1.08) 1.42** (1.25-1.61) 1.27 (0.93-1.73) 1.12 (0.88-1.42)</td>
</tr>
<tr>
<td>Response efficacy*a</td>
<td>3.66 (1.02)</td>
<td>1.32** (1.18-1.49) 1.08 (0.96-1.21) 0.92 (0.80-1.06) 0.81** (0.72-0.91) 0.75 (0.56-1.00) 1.67** (1.30-2.14)</td>
</tr>
<tr>
<td>Self efficacy*a</td>
<td>4.11 (1.08)</td>
<td>1.05 (0.95-1.17) 0.94 (0.84-1.04) 0.90 (0.78-1.04) 0.78** (0.69-0.88) 0.73* (0.55-0.97) 2.14** (1.54-2.98)</td>
</tr>
<tr>
<td>Response costs*a</td>
<td>3.71 (1.10)</td>
<td>1.15* (1.03-1.27) 1.24** (1.12-1.38) 1.06 (0.93-1.2) 1.42** (1.27-1.58) 1.50** (1.16-1.93) 0.85 (0.70-1.02)</td>
</tr>
</tbody>
</table>

*a Scores range from 1 (Strongly disagree) to 5 (Strongly agree)  * Significant association at the 0.05 level  
** Scores range from 0 (not at all anxious) to 24 (very anxious)  ** Significant association at the 0.01 level

Trust, anxiety, threat appraisals and response efficacy were all significantly positively associated with the intention to stay inside in the post office scenario. There was no association between self efficacy and the intention to stay inside and response costs were positively associated with this intention.

Trust, perceived severity, perceived likelihood of exposure, response efficacy and self efficacy were all positively associated with the intention to fully comply with the
recommended action. Emotional response was not associated with this intention nor was response costs.

Lower levels of perceived severity and perceived likelihood of exposure were associated with the intention of leaving the post office to go home and lower levels of response efficacy and self efficacy were associated with the intention to leave the area. Lower levels of self efficacy were also associated with the intention to collect children. Higher threat appraisals were associated with staying inside for some but not all of the recommended period and higher levels of perceived severity and emotional response were associated with leaving the area.

6.3.5 Association between demographic variables and behavioural intentions

Table 6.7 shows the association between demographic variables and behavioural intentions for the home scenario.

There was no association between demographic variables and the intention to stay inside. Men were significantly less likely to be fully compliant than women (odds ratio 0.65, 95% confidence interval 0.50-0.84) and the odds of full compliance were 10.76 times higher for UK participants than Polish participants (95% confidence interval 7.51-15.41). No other demographic variables were associated with full compliance.

Country was negatively associated with the intention to perform non-compliant behaviours, with UK participants significantly less likely to have the intention to perform these actions. Education, being employed, having school-aged children and access to a car were all significantly associated with the intention to leave the area.

Table 6.8 shows the association between demographic variables and behavioural intentions for the post office scenario.
Table 6.7: Association between demographic variables and behavioural intentions (if at home)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variable levels</th>
<th>N (%)</th>
<th>Odds ratio (95% confidence interval) for behavioural intentions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Male</td>
<td>605 (50.3%)</td>
<td>Stay inside 0.66 (0.41-1.07)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>598 (49.7%)</td>
<td>Reference</td>
</tr>
<tr>
<td>Age</td>
<td>18-24</td>
<td>244 (20.3%)</td>
<td>1.38 (0.71-2.66)</td>
</tr>
<tr>
<td></td>
<td>25-44</td>
<td>497 (41.3%)</td>
<td>1.41 (0.83-2.39)</td>
</tr>
<tr>
<td></td>
<td>45-65</td>
<td>462 (38.4%)</td>
<td>Reference</td>
</tr>
<tr>
<td>Country</td>
<td>UK</td>
<td>601 (50%)</td>
<td>1.44 (0.89-2.33)</td>
</tr>
<tr>
<td></td>
<td>Poland</td>
<td>602 (50%)</td>
<td>Reference</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>White or Polish</td>
<td>1152 (95.8%)</td>
<td>1.28 (0.38-4.24)</td>
</tr>
<tr>
<td>Ethn Minority</td>
<td>40 (3.3%)</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Education</td>
<td>GCSE or equiv</td>
<td>399 (35.0%)</td>
<td>0.93 (0.54-1.62)</td>
</tr>
<tr>
<td></td>
<td>A Level or equiv</td>
<td>246 (21.6%)</td>
<td>1.46 (0.70-3.04)</td>
</tr>
<tr>
<td></td>
<td>Degree +</td>
<td>494 (43.4%)</td>
<td>Reference</td>
</tr>
<tr>
<td>Working status</td>
<td>Not working</td>
<td>384 (32.4%)</td>
<td>1.71 (0.97-3.02)</td>
</tr>
<tr>
<td></td>
<td>Working</td>
<td>801 (67.6%)</td>
<td>Reference</td>
</tr>
<tr>
<td>Children</td>
<td>School age</td>
<td>442 (36.7%)</td>
<td>0.61 (0.32-1.18)</td>
</tr>
<tr>
<td></td>
<td>Not school age</td>
<td>199 (16.5%)</td>
<td>0.69 (0.40-1.18)</td>
</tr>
<tr>
<td></td>
<td>No children</td>
<td>562 (46.7%)</td>
<td>Reference</td>
</tr>
<tr>
<td>Access to car</td>
<td>Yes</td>
<td>889 (73.9%)</td>
<td>1.02 (0.59-1.75)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>314 (26.1%)</td>
<td>Reference</td>
</tr>
</tbody>
</table>

a Numbers that do not sum to 1203 are the result of ‘other’ responses  
* Significant association at the 0.05 level  
** Significant association at the 0.01 level
<table>
<thead>
<tr>
<th>Variable</th>
<th>N (%)</th>
<th>Odds ratio (95% confidence interval) for behavioural intentions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stay inside</td>
<td>Stay inside for some but not entire period</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>605 (50.3%)</td>
<td>0.98 (0.78-1.24)</td>
</tr>
<tr>
<td>Female</td>
<td>598 (49.7%)</td>
<td>Reference</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>244 (20.3%)</td>
<td>1.04 (0.76-1.42)</td>
</tr>
<tr>
<td>25-44</td>
<td>497 (41.3%)</td>
<td>0.85 (0.66-1.10)</td>
</tr>
<tr>
<td>45-65</td>
<td>462 (38.4%)</td>
<td>Reference</td>
</tr>
<tr>
<td>Country</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>601 (50%)</td>
<td>0.20** (0.15-0.25)</td>
</tr>
<tr>
<td>Poland</td>
<td>602 (50%)</td>
<td>Reference</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White or Polish</td>
<td>1152 (95.8%)</td>
<td>1.31 (0.69-2.48)</td>
</tr>
<tr>
<td>Ethnic minority</td>
<td>40 (3.3%)</td>
<td>Reference</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GCSE or equiv</td>
<td>399 (35.0%)</td>
<td>1.17 (0.89-1.52)</td>
</tr>
<tr>
<td>A Level or equiv</td>
<td>246 (21.6%)</td>
<td>0.64** (0.47-0.88)</td>
</tr>
<tr>
<td>Degree +</td>
<td>494 (43.4%)</td>
<td>Reference</td>
</tr>
<tr>
<td>Working status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not working</td>
<td>384 (32.4%)</td>
<td>1.03 (0.81-1.32)</td>
</tr>
<tr>
<td>Working</td>
<td>801 (67.6%)</td>
<td>Reference</td>
</tr>
<tr>
<td>Children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School age</td>
<td>442 (36.7%)</td>
<td>1.48* (1.07-2.07)</td>
</tr>
<tr>
<td>Not school age</td>
<td>199 (16.5%)</td>
<td>0.91 (0.71-1.17)</td>
</tr>
<tr>
<td>No children</td>
<td>562 (46.7%)</td>
<td>Reference</td>
</tr>
<tr>
<td>Access to car</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>889 (73.9%)</td>
<td>1.01 (0.78-1.31)</td>
</tr>
<tr>
<td>No</td>
<td>314 (26.1%)</td>
<td>Reference</td>
</tr>
</tbody>
</table>

*Numbers that do not sum to 1203 are the result of 'other' responses

*Significant association at the 0.05 level
**Significant association at the 0.01 level
Again the demographic feature which had most impact on behavioural intentions was country. UK participants were significantly more likely to fully comply and significantly less likely to express the intention to perform non-compliant behaviours. Interestingly, UK participants were also significantly less likely to indicate the intention to stay inside in the post office scenario.

Participants who were not employed were also significantly more likely to be fully compliant in the post office scenario. Lower educational level and having school age children were associated with the intention to stay inside.

Age was significantly associated with the intention to leave to check on others and to leave the area, with 25-44 year olds more likely to have the intention to perform both of these actions. Unemployment was negatively associated with the intention to leave the area.

### 6.3.6 Mediators of the difference between UK and Poland

Table 6.9 compares demographic and perception variables across countries.

There were significant educational differences between UK and Polish participants ($\chi^2 = 72.48, p<0.0005$). There were also significant differences in perceptions about the incident. Polish participants demonstrated significantly higher levels of anxiety ($t =19.18, p<0.0005$) and scored more highly on perceived severity ($t=10.564, p<0.0005$), perceived likelihood of exposure ($t =3.099, p=0.002$) and emotional response ($t=11.114, p<0.0005$). Polish participants also provided lower self-efficacy scores ($t =5.727, p<0.0005$) and higher response cost scores ($t =8.005, p<0.0005$).

Table 6.10 shows the associations between country and behavioural intention for the home scenario, adjusted for the demographic and perception variables that were significantly different between countries.
Table 6.9: Cross cultural comparison of demographic and perception variables

<table>
<thead>
<tr>
<th>Sample characteristics</th>
<th>UK Frequency (%)</th>
<th>Poland Frequency (%)</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>304 (50.6)</td>
<td>301 (50.0)</td>
<td>χ² = 0.04, p = 0.84</td>
</tr>
<tr>
<td>Female</td>
<td>297 (49.4)</td>
<td>301 (50.0)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>118 (19.6)</td>
<td>126 (20.9)</td>
<td>χ² = 0.31, p = 0.86</td>
</tr>
<tr>
<td>25-44</td>
<td>250 (41.6)</td>
<td>247 (41.0)</td>
<td></td>
</tr>
<tr>
<td>45-65</td>
<td>233 (38.8)</td>
<td>229 (38.0)</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GCSE (or equiv)</td>
<td>143 (25.8)</td>
<td>256 (43.8)</td>
<td>χ² = 72.48, p &lt; 0.0005</td>
</tr>
<tr>
<td>A level (or equiv)</td>
<td>173 (31.2)</td>
<td>73 (12.5)</td>
<td></td>
</tr>
<tr>
<td>Degree or higher</td>
<td>239 (43.1)</td>
<td>255 (43.7)</td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Working</td>
<td>205 (34.1)</td>
<td>179 (30.7)</td>
<td>χ² = 1.62, p = 0.20</td>
</tr>
<tr>
<td>Working</td>
<td>396 (65.9)</td>
<td>405 (69.3)</td>
<td></td>
</tr>
<tr>
<td>Children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School age children</td>
<td>210 (34.9)</td>
<td>232 (38.5)</td>
<td>χ² = 17.67, p &lt; 0.0005</td>
</tr>
<tr>
<td>Children not of school age</td>
<td>78 (13.0)</td>
<td>121 (20.1)</td>
<td></td>
</tr>
<tr>
<td>No children</td>
<td>313 (52.1)</td>
<td>249 (41.4)</td>
<td></td>
</tr>
<tr>
<td>Use of car?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>443 (73.7)</td>
<td>446 (74.1)</td>
<td>χ² = 0.02, p = 0.88</td>
</tr>
<tr>
<td>No</td>
<td>158 (26.3)</td>
<td>156 (25.9)</td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>3.41 (0.89)</td>
<td>3.50 (0.87)</td>
<td>t = 1.885, p = 0.06</td>
</tr>
<tr>
<td>Anxiety</td>
<td>17.35 (4.25)</td>
<td>21.33 (2.80)</td>
<td>t = 19.18, p &lt; 0.0005</td>
</tr>
<tr>
<td>Perceived severity</td>
<td>3.24 (1.08)</td>
<td>3.90 (1.04)</td>
<td>t = 10.564, p &lt; 0.0005</td>
</tr>
<tr>
<td>Perceived likelihood of exposure</td>
<td>3.71 (0.96)</td>
<td>3.88 (1.02)</td>
<td>t = 3.099, p = 0.002</td>
</tr>
<tr>
<td>Emotional response</td>
<td>3.77 (1.01)</td>
<td>4.35 (0.79)</td>
<td>t = 11.114, p &lt; 0.0005</td>
</tr>
<tr>
<td>Response efficacy</td>
<td>3.62 (1.01)</td>
<td>3.70 (1.04)</td>
<td>t = 1.285, p = 0.199</td>
</tr>
<tr>
<td>Self efficacy</td>
<td>4.29 (0.99)</td>
<td>3.94 (1.14)</td>
<td>t = 5.727, p &lt; 0.0005</td>
</tr>
<tr>
<td>Response costs</td>
<td>3.46 (1.14)</td>
<td>3.96 (1.00)</td>
<td>t = 8.005, p &lt; 0.0005</td>
</tr>
</tbody>
</table>
Table 6.10: Association between behavioural intentions if at home and country

<table>
<thead>
<tr>
<th>Behavioural intention</th>
<th>Country</th>
<th>Frequencies (%)</th>
<th>Odds ratio (95% CI) for country</th>
<th>Adjusted odds ratio (95% CI)* for country</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>UK</td>
<td>Poland</td>
<td></td>
</tr>
<tr>
<td>Stay inside:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>30 (5.0)</td>
<td>42 (7.1)</td>
<td>1.44</td>
<td>1.47</td>
</tr>
<tr>
<td>Likely</td>
<td>565 (95.0)</td>
<td>551 (92.9)</td>
<td>(0.89-2.33)</td>
<td>(0.77-2.81)</td>
</tr>
<tr>
<td>Stay inside for some but not entire period²:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>353 (60.3)</td>
<td>106 (18.6)</td>
<td>0.15**</td>
<td>0.11**</td>
</tr>
<tr>
<td>Likely</td>
<td>232 (39.7)</td>
<td>464 (81.4)</td>
<td>(0.12-0.20)</td>
<td>(0.08-0.16)</td>
</tr>
<tr>
<td>Leave home to check on others³:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>381 (67.8)</td>
<td>88 (15.3)</td>
<td>0.09***</td>
<td>0.07***</td>
</tr>
<tr>
<td>Likely</td>
<td>181 (32.2)</td>
<td>489 (84.7)</td>
<td>(0.06-0.11)</td>
<td>(0.05-0.10)</td>
</tr>
<tr>
<td>Leave the area⁴:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>501 (85.3)</td>
<td>193 (34.4)</td>
<td>0.09**</td>
<td>0.09**</td>
</tr>
<tr>
<td>Likely</td>
<td>86 (14.7)</td>
<td>368 (65.6)</td>
<td>(0.07-0.12)</td>
<td>(0.07-0.14)</td>
</tr>
<tr>
<td>Collect children (parents of school children only)⁵:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>47 (27.6)</td>
<td>27 (14.1)</td>
<td>0.43**</td>
<td>0.50*</td>
</tr>
<tr>
<td>Likely</td>
<td>123 (72.4)</td>
<td>165 (85.9)</td>
<td>(0.25-0.73)</td>
<td>(0.26-0.94)</td>
</tr>
<tr>
<td>Fully compliant⁶:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not compliant</td>
<td>339 (56.6)</td>
<td>561 (93.3)</td>
<td>10.76**</td>
<td>14.63**</td>
</tr>
<tr>
<td>Compliant</td>
<td>260 (43.4)</td>
<td>40 (6.7)</td>
<td>(7.51-15.41)</td>
<td>(9.24-23.17)</td>
</tr>
</tbody>
</table>

* All odds ratios adjusted for education, anxiety, perceived severity, perceived likelihood of exposure, emotional response, self-efficacy and response cost. Variables 1, 2, 3, 4 and 6 were also adjusted for whether participants had children of school age, children not of school age or no children.

* Significant association at the 0.05 level
** Significant association at the 0.01 level

Taking into account differences in demographics and perceptions about the incident, UK participants remained significantly more likely to intend being fully compliant (adjusted odds ratio 14.63, 95% confidence interval 9.24-23.17) and less likely to perform all non-compliant behaviours.

Table 6.11 shows the associations between country and behavioural intention for the post office scenario, adjusted for demographic and perception variables that were significantly different between countries.
Table 6.11: Association between behavioural intention if at post office and country

<table>
<thead>
<tr>
<th>Behavioural intention</th>
<th>Country</th>
<th>Frequencies (%)</th>
<th>Odds ratio (95% CI) for country</th>
<th>Adjusted odds ratio (95% CI) for country</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UK</td>
<td>Poland</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stay inside¹:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>417 (70.4)</td>
<td>185 (31.7)</td>
<td>0.20**</td>
<td>0.22**</td>
</tr>
<tr>
<td>Likely</td>
<td>175 (29.6)</td>
<td>398 (68.3)</td>
<td>(0.15-0.25)</td>
<td>(0.16-0.30)</td>
</tr>
<tr>
<td>Stay inside for some but not entire period²:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>429 (72.7)</td>
<td>142 (24.5)</td>
<td>0.12**</td>
<td>0.12**</td>
</tr>
<tr>
<td>Likely</td>
<td>161 (27.3)</td>
<td>437 (75.5)</td>
<td>(0.09-0.16)</td>
<td>(0.09-0.17)</td>
</tr>
<tr>
<td>Leave post office to go home³:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>137 (23.2)</td>
<td>101 (17.4)</td>
<td>0.70*</td>
<td>0.53**</td>
</tr>
<tr>
<td>Likely</td>
<td>454 (76.8)</td>
<td>478 (82.6)</td>
<td>(0.53-0.93)</td>
<td>(0.37-0.77)</td>
</tr>
<tr>
<td>Leave the area⁴:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>367 (62.3)</td>
<td>91 (16.0)</td>
<td>0.12**</td>
<td>0.11**</td>
</tr>
<tr>
<td>Likely</td>
<td>222 (37.7)</td>
<td>478 (84.0)</td>
<td>(0.09-0.15)</td>
<td>(0.08-0.16)</td>
</tr>
<tr>
<td>Collect children (parents of school children only)⁵:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not likely</td>
<td>39 (23.5)</td>
<td>20 (10.4)</td>
<td>0.38**</td>
<td>0.44*</td>
</tr>
<tr>
<td>Likely</td>
<td>127 (76.5)</td>
<td>172 (89.6)</td>
<td>(0.21-0.68)</td>
<td>(0.21-0.90)</td>
</tr>
<tr>
<td>Fully compliant⁶:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not compliant</td>
<td>538 (90.1)</td>
<td>570 (95.0)</td>
<td>2.08**</td>
<td>3.01**</td>
</tr>
<tr>
<td>Compliant</td>
<td>59 (9.9)</td>
<td>30 (5.0)</td>
<td>(1.32-3.28)</td>
<td>(1.68-5.38)</td>
</tr>
</tbody>
</table>

* All odds ratios adjusted for education, anxiety, perceived severity, perceived likelihood of exposure, emotional response, self-efficacy and response cost. Variables 1, 2, 3, 4 and 6 were also adjusted for whether participants had children of school age, children not of school age or no children

* Significant association at the 0.05 level
** Significant association at the 0.01 level

Taking into account differences in demographics and perceptions about the incident, UK participants remained significantly more likely to intend being fully compliant (adjusted odds ratio 3.01, 95% confidence interval 1.68-5.38) and significantly less likely to perform all non-compliant behaviours. Polish participants were also still significantly more likely to say that they intended to stay inside (adjusted odds ratio 0.22, 95% confidence interval 0.16-0.30)

6.3.7 Trust in authorities

In addition to indicating their behavioural intentions following the chemical incident described in the scenario, participants were also asked to indicate how trustworthy they would find information provided by government officials, local authorities, as well as the three main
emergency services. Table 6.12 shows that in the UK, the three emergency services were rated as more trustworthy than government officials or local authorities, and that the fire and ambulance services were rated most highly ($F(2.6,1470.6)^{14} = 524.82$, $p<0.0005$). Similarly in Poland, emergency services were rated as more trustworthy than government officials or local authorities. In Poland the fire services were the most trusted source of information ($F(3.5,2083.5)^{15} = 542.69$, $p<0.0005$).

<table>
<thead>
<tr>
<th>Information source</th>
<th>UK</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government officials</td>
<td>2.47 (0.84)</td>
<td>2.53 (0.81)</td>
</tr>
<tr>
<td>Local authorities</td>
<td>2.72 (0.76)</td>
<td>2.68 (0.81)</td>
</tr>
<tr>
<td>The police</td>
<td>3.24 (0.74)</td>
<td>3.16 (0.80)</td>
</tr>
<tr>
<td>Fire services</td>
<td>3.56 (0.59)</td>
<td>3.81 (0.45)</td>
</tr>
<tr>
<td>Ambulance services</td>
<td>3.56 (0.58)</td>
<td>3.44 (0.70)</td>
</tr>
</tbody>
</table>

### 6.4 Survey discussion

The survey results confirmed the focus group participants' expectations regarding non-compliant behaviours. Checking on others and collecting children from school were particularly problematic issues. This is consistent with what is known from previous incidents, for example attempts to contact others in the immediate aftermath of that attack on the World Trade Centre on 11 September 2001 (Schuster et al, 2001) and the bombings in London on 7 July 2005 (Rubin et al, 2005). There were also clear differences in levels of compliance depending on where participants were asked to imagine they were when the incident occurred. This suggests that people will be much more inclined to comply with instructions to shelter in place if they are at home. Interestingly, in the post office scenario

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14 Mauchley's test indicated the assumption of sphericity had been violated ($\chi^2 = 600.93$, $p<0.0005$) therefore degrees of freedom were corrected using the Greenhouse-Geisser estimate of epsilon ($\varepsilon = 0.65$)

15 Mauchley's test indicated the assumption of sphericity had been violated ($\chi^2 = 163.80$, $p<0.0005$) therefore degrees of freedom were corrected using the Huynh-Feldt estimate of epsilon ($\varepsilon = 0.88$)
there was not only an inclination to go home, but also a far greater intention to leave the area. This suggests the influence of location cannot be solely attributed to ease of compliance. The impact that location has on compliance therefore requires further investigation.

As discussed in Section 6.1, public perceptions about the severity of an incident and the ability of authorities to respond to the situation play a key role in determining the likelihood of compliance with official advice. Good communication during and after an incident is therefore an essential part of a successful response. An issue that has been much debated is the impact of communicating worst case scenarios or ‘precautionary’ statements. For example, contrary to the suggestions from focus group participants that they would attempt to play down the impact, it has been suggested that messages emphasising that recommendations are purely precautionary may actually amplify concerns and reduce trust in public health protection (Wiedemann and Schütz, 2005). Concerns have also been expressed about the potentially negative impact of ‘worst case scenario’ communications. For example, it has been suggested that during the 2009 H1N1 pandemic, reasonable worst case scenario communications were frequently misinterpreted as predictions (Chief Medical Officer’s Statistical Legacy Group, 2010). Our data suggest these concerns may be overstated, as responses were largely unaffected by style of presentation. This is consistent with previous research which suggests growing cynicism about media hyperbole in terms of reporting of disasters (Rubin et al, 2009; Wray et al, 2008); it is possible that the public are becoming used to seeing past the style of a message.

However our data do suggest some ways that communication strategies can be enhanced. PMT has been identified as a potentially useful framework for understanding public responses to recommended health behaviours (Teasdale et al, 2011). Our data broadly support this contention. In particular, coping appraisal seems to be a key predictor and useful in both the post office and home environment. This is consistent with meta-analyses which found coping appraisal to be the primary predictor of intentions and behaviour (Milne et al, 2000; Ruiter et al, 2001). Threat appraisal had a more complex relationship with intended behaviours. When in the post office threat appraisal was associated with staying in. This relationship was not apparent when participants were asked to think about what they would do if at home. Crucially, in both scenarios threat appraisal was associated with non-compliant behaviour. Using threat based communication may therefore be counterproductive. Again this is consistent with public responses to communications about swine flu (Rubin et al, 2009) and suggests that more emphasis should be given to addressing coping appraisals in crisis communications.
As shown repeatedly elsewhere (Rogers et al, 2007), trust is also an important factor and identifying who should give messages is crucial. Participants in both countries indicated they would trust information from emergency services more than from the government. This is similar to findings in Canada (Lemyre et al, 2006) and highlights the importance of ensuring that first responders are trained in crisis communication. Anxiety was associated with non-compliant behaviours in the home scenario, and with staying inside (either for some or all of the requested period) and leaving the area in the post office scenario. This suggests that anxiety promotes active behaviours. This is consistent with PMT which predicts that anxiety will motivate behaviour.

A comparison of UK and Polish responses supported our focus group participants’ expectations regarding lower levels of compliance in Poland. Polish participants also demonstrated lower levels of self efficacy and considered response costs to be higher, which is consistent with non-compliant behaviours according to PMT. However they also scored higher on all threat appraisal measures which would usually be associated with the adoption of protective behaviours. Regardless of differences in coping and threat appraisals, country remained a significant predictor of intention to comply. This has important implications for crisis communications, as it suggests that generic guidance on best-practice for communicating with the public (e.g. Hyer and Covello, 2005; The Council of the European Union, 2010) may need to be adapted to accommodate local concerns and likely behavioural responses.

6.5 Survey methodological limitations

Our survey measured behavioural intentions rather than objectively measured behaviour. Whilst behavioural intentions are known to be a key determinant of behaviour, other factors such as volitional control, social reaction and habitual control are likely to affect the extent to which behaviour reflects intentions (Webb and Sheeran, 2006). Furthermore, a hypothetical scenario was used to identify likely behaviours and perceptions. This makes it difficult to establish whether our results accurately reflect behaviours that would be performed in the event of a real incident. The fact that our findings were consistent with the expectations of health responders and that the associations we identified between perceptions and behavioural intentions were similar to those found in other, genuine incidents (Rubin et al, 2005, 2009) provides some reassurance on this issue.
As with all survey studies, the use of self-report data mean that results might be subject to social desirability bias. It is possible that this may account for the discrepancy between the large proportion of participants who indicated they would be likely to ‘stay inside’ as instructed and the relatively low levels of full compliance found when other behaviours were taken into account. Nevertheless, the very low levels of full compliance suggest that social desirability effects have not had a strong influence on overall findings.

A further issue relates to the measurement of perception variables. Although measures of anxiety and trust were based on scales that have been previously validated, due to survey length limitations PMT concepts were measured using single items. Some reassurance is provided by the similarity between our findings and research which used multiple measures for these concepts (Teasdale et al, 2011), but further studies with expanded scales are required to verify these findings.

A final caveat is that although participants were sampled on a quota basis to ensure they were demographically representative for each country, the use of an online survey means that individuals without internet access were excluded from this sample. Furthermore, the sample was made up of individuals who had volunteered for market research. People who volunteer for research are likely to differ from the general population. For example, they are likely to be better educated and have different lifestyles (Ebrahim, 1978). This raises questions about whether the findings may be generalised to the wider population. This issue may have been exacerbated by the possibility of different styles of survey responding in each country. This could mean that observed differences in UK and Polish responses could be a methodological artefact rather than a true reflection of differences in behavioural intentions. However, large differences in responses between countries, coupled with their consistency with focus group findings suggest that culturally specific response biases are unlikely to be able to fully account for our findings.

### 6.6 Survey conclusion

Coping appraisal appears to be an important predictor of behavioural intentions following a chemical incident emergency. This suggests that successful behavioural interventions must take into account perceptions regarding the efficacy of recommended behaviours, the difficulties people may have in following advice and their perceptions about the cost of following recommended behaviours. Future research should explore which aspects of coping appraisal are particularly important in these contexts. Differences between levels of intended compliance between countries suggest that generic principles of crisis communication may
need some adaptation for local contexts. For example, if a chemical incident emergency were to occur in Poland, greater emphasis on tackling low uptake of recommended behaviours may be required.
CONCLUSION

This report describes the outcomes of focus groups designed to identify UK and Polish health responders’ information needs and communication practices in the event of a chemical incident emergency. It also describes the outcomes of a survey with members of the public in the UK and Poland to ascertain their behavioural intentions following a chemical incident emergency and identify factors that may enhance or reduce the likelihood of public compliance with official advice.

Focus groups demonstrated a number of similarities in health responders’ information needs and communication practices in the UK and Poland. Surveys also identified shared features of public responses to the chemical incident scenario, including parental intention to collect children from school, the impact of location on likelihood of compliance with instructions to shelter, and the role of coping appraisals and trust in determining responses to public health messages. This suggests that generic and widely accepted principles of crisis communication would be equally applicable in the UK and Poland.

However, focus groups also identified differences in communication practices which suggest that there are particular training needs in each country. For example, greater emphasis may need to be placed on the fact that it is unadvisable to withhold unpalatable information from the media and the public with Polish responders. Furthermore, our survey data indicate a large difference between levels of intended compliance in the UK and Poland, which should be taken into account when developing crisis communication messages. It is therefore important that generic guidance is adapted to take into consideration local concerns and likely behavioural responses.

Based on focus group and survey findings, we propose the following recommendations for enhancing risk and crisis communication following a chemical incident emergency:

- Good inter-agency communication and information provision to frontline responders is vital for a successful response. Systems need to be put in place to ensure that individuals are clear about their roles and responsibilities in this process.

- Lack of public preparedness is potentially an issue in both the UK and Poland. This suggests a need for more effective pre-event communication.

- There is a perception amongst health responders in the UK and Poland that the public are likely to panic in the event of a chemical incident emergency. This assumption must be addressed as it is likely to have an adverse impact on crisis
communications. This is likely to be a particular problem in Poland where low levels of intended compliance suggest the likelihood of low-uptake of recommended health behaviours.

- There is a tendency amongst UK health responders to focus on provision of reassurance to the public during a chemical incident emergency. This may not be the most effective communication strategy to encourage protective behaviour. Crisis communicators should be aware that low-uptake of recommended behaviours may be as much if not more of a problem as an over-reaction from the public.

- There seems to be a tendency amongst Polish health responders to withhold unpalatable information. Health responders must be made aware that this is likely to be an unsuccessful strategy leading to loss of trust and non-optimal behavioural responses.

- Good working relationships with the media should be established prior to an event to ensure the timely dissemination of accurate information.

- Current good practice should be reinforced but health responders should also be made aware of the importance of recognising they are communicating to multiple audiences and that public consultation can be an effective tool for enhancing engagement and understanding.

- Crisis communications must take into consideration the fact that parents of children at school or nursery will want to collect their children regardless of instructions and the public are likely to want to check on friends and family following a chemical incident emergency.

- Crisis communications must also take into consideration the fact that location is likely to have an important impact on likelihood of compliance to instructions to stay in place and shelter, as people may be less likely to shelter in place if they are away from home when an incident occurs.

- Public perceptions regarding the efficacy of recommended behaviours, the difficulties they may have in following advice and their perceptions about the cost of following
recommended behaviours are all likely to play an important role in determining levels of compliance with public health recommendations.

- Trust plays an important role in responses to public health recommendations. It is important to ensure that credible sources are used for risk and crisis communication. The public in the UK and Poland are more likely to trust information provided by emergency response services than government officials.

- Crisis communicators should be cautious about adopting threat-based communications as they could potentially have adverse consequences on behavioural outcomes.

- Choosing between presenting a ‘worst case’ or ‘precautionary’ message may not have a particularly large impact on the success of crisis communication.


ACKNOWLEDGEMENTS

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Gudrun Cassel, Björn Sandström, Lena Norlander, Mirko Thorstensson and Håkan Eriksson (FOI)

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Brooke Rogers, Julia Pearce, James Rubin, Simon Wessely (KCL)
Annelieke Drogendijk, J Gouweloos (IVP)

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Appendix 1: Focus group newspaper article text

Appendix 2: Focus group discussion guidelines

Appendix 3: Focus group scenario cards

Appendix 4: Survey text
Residents living near the soon to be opened REDD shopping centre say increased traffic from the shopping development will cause gridlock in an already congested area. Campaigners against the £200m project believe it will increase pollution, traffic and noise in the area. Specifically, campaigners have urged councillors to review regulations over the use Redmarshall Road as a thoroughfare for heavy goods vehicles (HGVs) transporting goods to and from the ARC chemical plant. They are calling for a public inquiry before any final decision is made but many suspect that this inquiry will not take place before the grand opening of the REDD Centre on 16th of February.

Large crowds are expected to gather for the grand opening of Europe’s largest inner-city shopping centre. The REDD Centre boasts more than 1.6m sq ft (150,000 sq m) of space, the size of 30 football pitches. Billed as the shopping centre that can meet all of the needs of the modern family, this space will be filled with over 260 retail outlets, a petrol station, a gym, a drop-in healthcare centre, a day care facility, 2500 parking spaces, a multiplex cinema, and more. REDD development expects the centre to create an additional 7000 jobs in the area and have invested over £50million in public transport improvements, including bus routes and park and ride facilities.

The REDD Centre has received a mixed response locally. Alexandra Hamilton from the Bagton Residents’ Corporation said many residents had fears over the risk to children with extra traffic on surrounding roads. "With a proposed development requiring such a large number of parking spaces, we could be looking at a minimum of 2500 extra cars coming up and down here every day, not to mention the problems we already from the HGV traffic going to and coming from ARC Chemicals. It’s obviously not going to be a peaceful village location anymore."

Bagton Borough Council said traffic concerns would have to be addressed and that all developers were required to make a full assessment of the safety implications of their facility. "We have got to find a way to balance residents' concerns with those of needing to allow access to the REDD Centre which is vital to the growth and development of our area”.

Residents’ concerns over the increased pollution, traffic and noise associated with the opening of the REDD centre are being compounded by an ongoing altercation between the community of Bagton and the ARC Chemicals facility located just outside of the city limits. Bagton Borough Council planners approved the new plant expansion but residents said the decision was made without all the facts being publicised.

Locals said that any risks posed by producing, transporting or storing the highly flammable and toxic chemical have not been revealed and attempts to gain information on the scheme from the Health and Safety Executive, who gave its backing, were blocked.

The ARC Chemicals facility produces and stores acrylonitrile, a material used in the manufacture of plastics. The facility also uses a chlorine-based process to manufacture silicone which is being phased out in the USA - because of the toxic properties of chlorine compounds. Operating in the area for the past 10 years, the facility recently came under fire after plans to expand the chemical factory were approved despite environmental concerns from nearby residents.

The latest investment takes the workforce to 850 and the company says that the Bagton facility is now its most advanced plastics manufacturing plant anywhere, producing raw materials for its manufacturing plants worldwide.

Public concerns have been amplified by the grand opening of the REDD Centre as the main primary access road for the REDD Centre is also the designated HGV transport route for the large chemical tankers transporting goods to and from the ARC Chemicals facility.
Mieszkancy posesji sasiedzacych z terenem, na którym w najbliższym czasie otwarta zostanie nowa galeria handlowa REDD obawiają się, iż otwarcie centrum przyczyni się do zwiększenia ruchu, a co się z tym wiąże równie korków na i tak już zatłoczonych drogach.

Przeciwnicy dwustumilowej inwestycji przekonują, iż przyczyni się ona do zwiększenia zanieczyszczenia, nasilenia ruchu samochodowego i spowodowanego nim hałasu. Nalegają na radnych, aby ponownie sprawdzili czy pod względem prawnym ul. Krakowska może być główna arteria dla tırów przewożących towary do i z fabryki ARC Chemikalia. Przed podjęciem ostatecznej decyzji zadają rozprawy administracyjnej, jednak istnieje obawa, iż rozprawa nie odbędzie się przed wielkim otwarcie galerii handlowej zaplanowanej na 16 lutego br.

Tłumy gości maja się jawnie na wielkim otwarciu największej galerii handlowej w środoku miasta. Galeria REDD może się pochwalić powierzchnią 150,00 m2, co odpowiada 30 boiskom do gry w pilke nożna. Okrągła, jednym centrum handlowym spełniającym wszystkie potrzeby współczesnej rodziny, będzie miała do zaofierowania ponad 260 sklepów, stacje benzynowa, siłownie, centrum medyczne, przedszkole, 2500 miejsc parkingowych, kino oraz wiele innych atrakcji. Firma deweloperska REDD szacuje, iż galeria stworzy ponad 7000 nowych miejsc pracy. Obecnie zainwestowali ponad 50 milionów w usprawnienie komunikacji miejskiej, w tym nowe trasy autobusowe, oraz infrastrukturę "parkuj i jedź". Galeria REDD wywołuje różne opinie, iż, że wielu mieszkańców obawia się o swoje dzieci z powodu wzmożonego ruchu samochołowego na pobliskich drogach. „Z powodu zaplanowanej liczby miejsc parkingowych musimy liczyć się z min 2500 dodatkowych samochodów dziennie przejeżdżajacych ta trasa, nie wspominając o obecnym problemie tırów przejeżdżajacych do i z fabryki ARC Chemikalia. To już doszczelnie zakłóci nasz spokój.”


Dowodzi oni, że informacje na temat ryzyka spowodowanego produkacja, transportem oraz składowaniem wysoko palnych i trujących substancji zostały zatajone a próby uzyskania odpowiedzi od Sanepidu, który wskazał, że prawdziwe zarządy, zostały zignorowane.

ARC Chemikalia produkuje oraz skладa akrylonitryl, substancję wykorzystywana do produkcji plastiku. Fabryka wytwarza również silikon na bazie technologii z użyciem chloru, który stopniowo jest wyczyściwy od produkcji w Stanach z powodu toksycznych właściwości związków chloru. Fabryka, która pracuje od 10 lat, ostatnio znalazła się pod ostrzałem opinii publicznej, kiedy to otrzymała zgodę na rozbudowę pomimo obaw mieszkańców dotyczących ochrony środowiska.

Ostatnia inwestycja przyczyniła się do zwiększenia do 850 liczby miejsc pracy w fabryce. Dzięki rozbudowie stała się ona przedsiębiorstwem o najbardziej zaawansowanej technologii do produkcji plastiku i surowców dla swoich fabryk na całym świecie.

Obawy mieszkańców zostały spotęgowane przez wielkie otwarcie galerii handlowej REDD ponieważ główna trasa dojazdu do galerii jest również trasa cystern transportujących substancje chemiczne z i do fabryki ARC Chemikalia.
Appendix 2: Focus group discussion guidelines

1st Stage
Moderator distributes newspaper article with pre-event information (new big shopping centre opening in the city/issues with increased congestion and ongoing public concerns about chemical facility)

HAND OUT PAGE 1
Discussion guide:
- General reactions – response to the problem
- What organizational concerns they have / Potential problems?
- What would their organizational role be (if any) at this stage
- What would their individual role be (if any) at this stage
- Any possible actions likely to be considered
- Would they have had any contact with the shopping centre, the chemical plant or other government/emergency response organizations up to this point?
  If so, who/why/for what reason? (This might need prompting)

2nd Stage
Moderator distributes initial information about incident

Discussion guide:
- What they would do
  - Possible organizational actions likely to be considered
  - Possible individual actions likely to be considered
  - Temptation to inform relatives/ collect children from school etc ?
- As first responders with relevant experience, what potential difficulties problems do they anticipate
  - In the coordination
  - From the public response
  - What is it that worries you at this point? Why?
- What do you think would encourage people to follow official advice?

HAND OUT PAGE 2
- What information should the public receive at this stage?

3rd Stage
Moderator explains that it is now 15.30 pm on the same day – there is another update on the situation

Discussion guide:
- General reactions
- Possible actions likely to be considered/ how if at all development in situation would change response
- What concerns they have
- What concerns do they believe the public will have

HAND OUT PAGE 3
- What information should the public receive at this stage?

4th Stage
INJECT A
Moderator distributes further information: 3 eye-witnesses claim that the driver directed the vehicle intentionally towards the entrance of the shopping centre. Media have picked up the story

Discussion guide:
- Possible organizational/individual actions likely to be considered/ how if at all development in situation would change response?
- What concerns they have
- What concerns do they believe the public will have
INJECT B
Moderator explains that it is now 15.45 pm on the same day – there is another update on the situation re schools

Discussion guide:
- General reactions
- Possible organizational/individual actions likely to be considered
- Any potential problems you anticipate at this stage?

HAND OUT PAGE 4
- What is the information the public should receive at this stage? (list points)

5th Stage
Moderator explains that it is now one day after the incident.

Discussion guide:
- Share and discuss all views
- What they would do
  - Possible organizational actions likely to be considered
  - Possible individual actions likely to be considered
  - Possible problems at this stage
- Need or not for information on timing / level of contamination / safety of visiting area
  - Should the public be given information on the timing/contamination levels / safety of visiting area as the situation unfolds or to receive information only after the event?

6th Stage
Moderator explains that it is now one week after the incident.

Main questions:
- Please list any potential problems you anticipate at this stage
- How important do you think it is to provide information to the public at this stage?
- What is the information the public should receive at this stage?

Closing questions:
- How well prepared do they (as professionals) feel for this type of event?
- How well-prepared do they feel that members of the public are for this type of event?
- How big is the role of the public in this type of incident?
- How can we improve public preparedness?

Switch off voice recorder and video Moderator asks for some general information for statistical purposes (Demographics and background info) as well as feedback for this exercise, stressing confidentiality of information provided.

HAND OUT PAGE 5

Close
Appendix 3: UK focus group scenario cards

Pre-event information

**THE INDEPENDENT**

Seeing REDD: Residents of Bagton fear traffic gridlock and increased exposure to pollution

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**GENERAL AREA**

ARC CHEMICALS 3.5 miles

- Water reservoir
- School
- Train line
- City Hospital 1.7 miles
- City Centre 2.6 miles

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**Preliminary Incident information : 15.00**

- Weather in the city of Bagton is normal for this time of year. There is a high pressure, some cloud cover and a light wind (3m/s) from the South-West. The temperature is 18°C.

- At 14:00 today, an ARC chemical road tanker, believed to contain chlorine (UN 1017) crashed into a fuel tanker that had just arrived at the REDD shopping centre petrol station. A large explosion was heard for miles around and a cloud of gas is now billowing into the air. There is a fire at the petrol station, and it is reported that the petrol tanker, station and customer vehicles are on fire. A plume of black smoke is seen to be travelling towards the North-East and the center of the city where all the government buildings are located.

- The store fronts have been damaged and people are evacuating from the rear of the store away from the explosion.

- A major incident has been declared.
More detailed incident information: 14:30

- There are obvious serious casualties and fatalities at the scene. Although numbers are not known they appear substantial, early estimates are 85+.
- Access to the scene is via ReddMarshal Road from the A2, however the scene is already chaotic with ReddMarshal Road blocked by vehicles from both ends (A2 and A5). Road closures have been established.
- Emergency Service vehicles are at the RVP. People are still coming to the scene as onlookers try to help, whilst others are trying to leave the area causing further congestion.
- A Bronze Forward Control Point has been established on the sliproad off ReddMarshal Road.

Actual & expected spread

- ARC CHEMICALS
- 3.5 miles
- Water reservoir
- School
- Trash bin
- HOSPITAL
- CITY HOSPITAL
- 1.2 miles
- CITY CENTRE
- 2.4 miles
Inset A: 15.15

- All local agencies have been notified of the incident.
- There is a high media interest to all agencies.
- 3 eyewitnesses mention that the driver seemed to intentionally direct the vehicle into the fuel tanker.
- Precautionary evacuation procedures are being initiated in residential areas adjacent to the current spread

Inset B: 15.45

- Parents are trying to pick up their children from schools.
- Due to heavy traffic they cannot access schools in the city centre.
- School headmasters have contacted local authorities asking for advice.
- Hospital within predicted spread is awaiting instructions

Recovery Phase I
(24 hours after incident)

- The weather remains normal for this time of year. A high pressure system remains, with increased cloud cover and a light wind (3m/s) from the East blowing. The temperature is 15°C.
- The REDD petrol station is seriously damaged. The tarmac on the forecourt has been severely burnt; however, the underground fuel tanks remain intact and appear not to have been affected. The burnt-out tankers are still on the scene.
- The front part of the REDD shopping centre has been mostly destroyed with glass, display stands and products scattered across the scene.
- Access to the scene continues to be restricted as media attempt to get footage of the aftermath. The adjacent junction remains closed, however the rest of the cordon has been lifted.
Recovery Phase II
(1 week after incident)

- Chlorine has been deposited over the surrounding area.

- Local authorities are working with the environmental agency to assess the environmental impact and the need for decontamination.

- The Casualty Bureau continues to operate, as does the Survivor Reception Centre.
Appendix 3(b): Polish focus group scenario cards

Wstępne Informacje

Artykuł z Gazety Wyborczej
(załącznik)

OBSZAR OGÓLNY

Wstępne Informacje o Wypadku: 15.00

- Pogoda w Łękowicach jest typowa na tą porę roku. Wysokie ciśnienie, małe zachmurzenie oraz lekki południowo zachodni wiatr (3ms⁻¹). Temperatura wynosi 18°C.
- Dzisiaj o godzinie 14:00 cysterna ARC Chemikalia, która rzekomo przewoziła chlor (UN 1017), zderzyła się z cysterną paliwa, która właśnie wjechała na stację benzynową galerii handlowej REDD. Wielką eksplozję stłumaczy w promieniu paru km a chmura gazu kłębi się w powietrzu. Na stacji benzynowej wybuchł pożar, odnotowano iz cysterna paliwa, stacja benzynowa oraz pobliskie samochody stanęły w ogniu. Smuga czarnego dymu przesunięła się w kierunku północno wschodnim nad centrum miasta i wszystkie budynki rządowe.
- Uszkodzone zostały witryny galerii handlowej - ludzie ewakowują się drugim kierunkiem galerii z dala od eksplozji.
- Ogłoszono wysoki stopień zagrożenia
Szczegółowe Informacje o Wypadku: 14.30

- Na miejscu wypadku są ranni oraz ofiary. Pomimo, że dokładne dane nie są znane szacuje się, że liczba poszkodowanych przewyższa 65.
- Dojazd do miejsca wypadku prowadzi od ul. Krakowskiej z drogi krajowej nr 1, natomiast z powodu chaosu ul. Krakowska jest zakorkowana z obu stron (A1, A2). Zaplanowano zamknięcie dróg.
- Pomoc drogowa oraz medyczna są już na swoich stanowiskach. Ludzie nadal schodzą na miejsce zdarzenia aby popatrzyć albo pomóc. Niektórzy natomiast chcą się wydostać z miejsca wypadku tworzą jeszcze trudniejsze warunki pracy.
- Punkt kontrolny służb ratowniczych został zorganizowany na zjeździe z ul. Krakowskiej.
Sytuacja A: 15.15

- Wszystkie agencje zostały poinformowane o wypadku.
- Jest duże zainteresowanie ze strony mediów.
- 3 świadków twierdzi, że kierowca z premedytacją skierował cisternę ARC Chemikalia w stronę cisterny paliwowej.
- Zapobiegawcza procedura ewakuacji została podjęta na obszarze przylegającym do miejsca zdarzenia.

Sytuacja B: 15.45

- Rodzice próbują odebrać dzieci ze szkół.
- Ze względu na wzmożony ruch nie mogą dojechać do szkół w centrum miasta.
- Dyrektorowie szkół zwrócili się o radę do władz lokalnych.
- Szpital w obszarze wypadku czeka na instrukcje.

1 faza po wypadku
(24 godziny po wypadku)

- Pogoda pozostaje taka sama na tą porę roku. Nadal odnotowuje się wysokie ciśnienie, więcej chmur oraz lekki wschódni wiatr (3m/s³). Temperatura wynosi 15°C.
- Największe szkody w galerii handlowej to wybita przednia część wiryn, szklane powierzchnie. Produkty porozrzucane na miejscu zdarzenia.
- Dojazd do miejsca wypadku jest nadal ograniczony z powodu medii zbierających materiał o zdarzeniu. Skrzyżowanie jest wciąż zamknięte, natomiast reszta blokad została zdjęta.
2 faza po wypadku
(1 tydzień po)

- chlor osadził się na dużej powierzchni w Sulejówku oraz w pobliskich miejscowościach na wschód.

- Władze miejskie współpracują z agencją środowiskową aby oszacować wpływ na środowisko oraz potrzebę odkażenia

- Biuro ds. poszkodowanych cały czas pracuje
Appendix 4: Survey text

Screen 1– informed consent

We are carrying out a survey on behalf of King’s College London which should not take longer than XX minutes and you will be awarded XX points. We would like to know people’s opinions about a hypothetical chemical incident in your local area. The aim of the survey is to help emergency planners to take public views into account when planning for emergencies. This survey is part of a larger project funded by the European Commission. We are interested in how people might react to a range of different scenarios involving a release of industrial chemicals. If you are happy to proceed, then we will randomly select one of these scenarios for you to read.

Before we go on, there are some points that we would like to make sure you are aware of:

- We would like to assure you that all of the information we collect will be kept in the strictest confidence and used for research purposes only. It will not be possible to identify any individual in the reporting of the results.

- We may share the data from this survey with other research teams who are interested in this topic. If we do this, we will first make sure that you cannot be identified from the data.

- Participation in this survey is entirely voluntary, and you can withdraw from it at any time and without giving a reason.

- Data collected in this survey will be treated in accordance with the Data Protection Act 1998.

- And finally, if you would like to speak to someone about this survey, you can contact Dr Julia Pearce at King’s College London at julia.pearce@kcl.ac.uk

I have read the information on this page and am happy to take part in the study – tick box

NB – PLEASE SCREEN OUT ANYONE WHO DOES NOT TICK TO INDICATE INFORMED CONSENT

Screen 2: Demographics

Please tick one box in response to each question:

Q1 Sex: Male □ Female □

Q2 Age: 18-24 □ 25-44 □ 45-65 □

Q3 Ethnicity: White British □ White other □ Black British □ Black other □ Asian British □ Asian other □ Other □

Q4 Education: Please indicate your highest educational qualification

- GCSE (or equivalent) □ A level (or equivalent) □ Degree □ Post-graduate qualification □ Other □

NB – PLEASE USE HARD QUOTAS FOR SAMPLING
Screen 3a:
Condition I: reassurance

We would like to present a hypothetical emergency situation in which members of the public could be exposed to a harmful chemical.

Please imagine that it is a Tuesday afternoon and you hear on the news that there has been a collision at a local petrol station between a tanker carrying a chemical substance and a fuel tanker. This resulted in a large explosion and a plume of black smoke has been released into the air.

10 minutes later, you hear a radio announcement by a police official advising that:

"At 14:25 today there was a collision between two tankers at a local petrol station, resulting in the release of chlorine gas. We have consulted with health experts who have confirmed that it is unlikely that this gas will pose any health risk to those who come into contact with it. However, in the worst case scenario it could prove fatal. Based on this advice, we believe that it is very unlikely that the cloud will cause any noticeable health effects to the local community. However, as a precautionary measure, we would ask all local residents to stay indoors with doors and windows closed for the next 8 hours. We will issue further advice by television and radio as we receive more information. We are issuing this advice purely as a precautionary measure and would like to reassure members of the public that the cloud is unlikely to have any noticeable effect on their health."

Which of these actions is the police official recommending?
A. Try to leave the area as soon as possible
B. Stay indoors with doors and windows closed for the next 8 hours
C. Stay indoors with doors and windows closed for the next 12 hours
D. Go to the nearest shop and stock up with supplies

NB - EACH PARTICIPANT WILL ONLY SEE SCREEN 3a OR 3b OR 3c - i.e. 200 Ps in each country for each condition. PLEASE SCREEN OUT ANYONE WHO DOES NOT SELECT RESPONSE B

Screen 3b:
Condition II: Worst case scenario

We would like to present a hypothetical emergency situation in which members of the public could be exposed to a harmful chemical.

Please imagine that it is a Tuesday afternoon and you hear on the news that there has been a collision at a local petrol station between a tanker carrying a chemical substance and a fuel tanker. This resulted in a large explosion and a plume of black smoke has been released into the air.

10 minutes later, you hear a radio announcement by a police official advising that:

"At 14:25 today there was a collision between two tankers at a local petrol station, resulting in the release of chlorine gas. We have consulted with health experts who have confirmed that it is unlikely that this gas will pose any health risk to those who come into contact with it. However, in the worst case scenario it could prove fatal. Based on this advice, we believe that it is possible that this cloud may cause severe health effects to the local community. We are therefore asking all local residents to stay indoors with windows and doors closed for the next 8 hours. We will issue further advice by television and radio as we receive more information. We are issuing this advice as there is a possibility that this gas could have a very negative impact on the health of the community."

Which of these actions is the police official recommending?
A. Try to leave the area as soon as possible
B. Stay indoors with doors and windows closed for the next 8 hours
C. Stay indoors with doors and windows closed for the next 12 hours
D. Go to the nearest shop and stock up with supplies

NB - EACH PARTICIPANT WILL ONLY SEE SCREEN 3a OR 3b OR 3c - i.e. 200 Ps in each country for each condition. PLEASE SCREEN OUT ANYONE WHO DOES NOT SELECT RESPONSE B
Screen 3c: Condition III: control

We would like to present a hypothetical emergency situation in which members of the public could be exposed to a harmful chemical.

Please imagine that it is a Tuesday afternoon and you hear on the news that there has been a collision at a local petrol station between a tanker carrying a chemical substance and a fuel tanker. This resulted in a large explosion and a plume of black smoke has been released into the air.

10 minutes later, you hear a radio announcement by a police official advising that:

"At 14:25 today there was a collision between two tankers at a local petrol station, resulting in the release of chlorine gas. We have consulted with health experts who have confirmed that it is unlikely that this gas will pose any health risk to those who come into contact with it. However, in the worst case scenario it could prove fatal. Based on this advice, we would ask all local residents to stay indoors with windows and doors closed for the next 8 hours. We will issue further advice by television and radio as we receive more information. We are issuing this advice based on the information we have received from health experts."

Which of these actions is the police official recommending?
A. Try to leave the area as soon as possible
B. Stay indoors with doors and windows closed for the next 8 hours
C. Stay indoors with doors and windows closed for the next 12 hours
D. Go to the nearest shop and stock up with supplies

NB – EACH PARTICIPANT WILL ONLY SEE SCREEN 3a OR 3b OR 3c – i.e. 200 Ps in each country for each condition. PLEASE SCREEN OUT ANYONE WHO DOES NOT SELECT RESPONSE B

Screen 4: Behavioural intentions a

If this situation occurred while you were at home, in the 8 hours following this incident would you:

<table>
<thead>
<tr>
<th>Action</th>
<th>Not at all likely</th>
<th>Not very likely</th>
<th>Fairly likely</th>
<th>Very likely</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stay inside your home</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Stay inside your home for some but not all of this period</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Leave home in order to check on vulnerable neighbours, family or friends</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Collect your children from school or day care</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Leave the area</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Screen 5: Behavioural intentions b

If this situation occurred while you were at the local post office, in the 8 hours following this incident would you:

<table>
<thead>
<tr>
<th>Action</th>
<th>Not at all likely</th>
<th>Not very likely</th>
<th>Fairly likely</th>
<th>Very likely</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stay inside the post office</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Stay inside the post office for some but not all of this period</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Leave the post office and go straight home</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Collect your children from school or day-care</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Leave the area</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Screen 6: STAI 6

Please indicate to what extent you would feel each of the following emotions if this chemical incident occurred in your local area:

<table>
<thead>
<tr>
<th>Emotion</th>
<th>Not at all</th>
<th>Somewhat</th>
<th>Moderately</th>
<th>Very Much</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calm</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Tense</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Upset</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Relaxed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Content</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Worried</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>
### Screen 7: PMT factors

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Strongly disagree</th>
<th>Tend to disagree</th>
<th>Neither agree nor disagree</th>
<th>Tend to agree</th>
<th>Strongly agree</th>
<th>No Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>If I was exposed to the chemicals released in this incident, it is likely that I would become seriously ill.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>If I didn’t take preventative action it is likely that I would be exposed to the chemicals released in this incident.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>I would feel anxious about being exposed to the chemicals released in this incident.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>If I stayed indoors with the windows and doors closed I would be safe from any chemicals released in this incident.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>It would be possible for me to stay indoors with the windows and doors closed for 8 hours following this incident.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>If I stayed indoors for 8 hours following the incident I would not be able to help the people I care about.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

### Screen 8: Trust - efficacy

The next questions ask about how you think “the authorities” would deal with this incident. By “authorities” we mean the Government, the HHS, and other agencies such as the Health Protection Agency. Please indicate how much you agree or disagree with each of the following statements.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Strongly disagree</th>
<th>Tend to disagree</th>
<th>Neither agree nor disagree</th>
<th>Tend to agree</th>
<th>Strongly agree</th>
<th>No Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I think the authorities would do a good job when dealing with this incident.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>I think the authorities would have enough resources to cope with this incident.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>I think the authorities have the necessary knowledge to deal with this incident.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>I think the authorities would act in the public’s best interest in dealing with this incident.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>I think the authorities would be open and honest with the public about this incident.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
Screen 9: Trust (from Kok et al 2000)

If this type of chemical incident occurred, information could be provided to you by the following sources. How trustworthy would you consider the information from these sources to be?

<table>
<thead>
<tr>
<th>Source</th>
<th>Not at all trustworthy</th>
<th>Not very trustworthy</th>
<th>Reasonably trustworthy</th>
<th>Very trustworthy</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government officials</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Local authorities</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The police</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Fire services</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Ambulance services</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Screen 10: Demographics

Occupation (please specify):

Do you work full time? Yes [ ] No [ ]

Do you work part time? Yes [ ] No [ ]

Do you have any children? Yes [ ] No [ ]

If so: How many children? [drop down box]
What are their ages? [numeric open boxes]

Do you have the use of a car? Yes [ ] No [ ]