Chemical Hazards and Poisons Division

Public Health Surveillance of Chemical Incidents

Surveillance report 1st July – 30th September 2005

Environmental Health and Risk Assessment Unit, Chemical Hazards and Poisons Division (Head Office), HPA, Centre for Radiation, Chemical and Environmental Hazards, Chilton, Didcot, Oxon, OX11 0RQ, Tel +44 (0)1235 822895, Fax +44 (0)1235 822614, www.hpa.org.uk.

Summary

- **Between 1st July and the 30th September 2005, 285 acute chemical incidents were recorded by CHaPD on the on-line database.**

- **Of the 285 reported incidents 63 were removed because of failure to match the definition of an acute chemical incident (see paragraph 3 below). A further 3 incidents were removed as duplicate entries. Annex I describes those reports excluded from this analysis. The remaining 219 incidents were included for further analysis described in this report.**

- **The chemical groups most frequently identified was products of combustion (27%, n=60), followed by asbestos (11%, n=25), halogens and organic chemicals (9%, n=20). The chemical involved was not identified in 40 (18%) incident reports. For the reporting period chemical incidents were most frequently reported in London (22 %, n=45), followed by the South East (17%, n=38) and the South West (16 %, n=35). The location of all included incidents was reported to government office region level.**

- **The reporting source of the 219 incidents was most commonly not described (30 %, n=66). Where the notifying organisation was recorded, the most common source of incidents was from Health Protection Units (HPUs) (22%, n=48), via the Fire Service (9 %, n=20) and the National Poisons Information Service (9%, n=19). This pattern of notification is expected given the hotline is used by HPUs, Emergency services and Primary Care Trusts to contact division for advice,**

- **In 17% (n=38) of reported incidents 1-10 people were exposed to the chemical hazard and in 5% (n=61) 1-10 people showed clinical symptoms. Fatalities were reported at a fire and from a suicide. During the reporting period four explosions were reported in London which resulted in 52 deaths. These incidents have been included in the summary data for this report as one incident, but are discussed further in annex II.**

Introduction

1. This report provides a summary of the acute chemical incidents recorded on the on-line database between the 1st July and 30th September. All incidents were logged in the on-line database, by all the CHaPD units. An extract of the database was forwarded to the Chilton unit to produce this report.

2. Scotland Health Protection Service (HPS), Local and Regional Services (LARS) and National Chemical Emergency Centre chemical incident surveillance data was not

available at the time of writing; however these data providers have agreed to provide quarterly updates. CHaPD and The Environment Agency are in the process of signing a Memorandum of Understanding and a Service Level Agreement to allow an exchange of surveillance data between organisations. This exchange is expected to take place early 2006.

3. Previous reports have used the National Focus programme[1] definition of a chemical incident. An updated definition (**annex III**) of an acute chemical incident has been used for this reporting.

4. The initial 285 incidents logged were screened and 66 reported cases were removed as duplicates or not meeting the definition. The most common (n=21) cause for incident removal was it could not be substantiated that the report met the definition criteria. Several reports were requests for information (n=15) or related to chronic incidents (n=12). A summary of removed incidents is provided in **annex I** page 13.

Source of chemical incident reports

5. Between 1st July and the 30th September 2005, 22 % (n=48) acute chemical incidents were reported by local Health Protection Units (HPU), 9 % of incidents were reported via the Fire Service (n=20) and via the National Poisons Information Service (n=19). In 30 % (n=60) of incidents the notifying organisation was not recorded. (Figure 1).

6. Figure 2 shows the trend in number of incidents per notifying agency reported over the previous two quarters in 2005. The chart shows that Health Protection Units (HPUs) and the National Poisons Information notify CHaPD of approximately a third of the total number of incidents, with another third not being assigned a notifying source. No major differences are observed between quarters two and three with the exceptions of those incidents reported via the media and those where a notifying organisation was not recorded. A 7 % decrease was observed between quarters two and three in the number of incidents reported from media sources. A 17 % increase was observed between quarters two and three in the number of incidents where the notifying organisation was not recorded.

Chemicals involved in incidents during reporting period

7. A breakdown of the type of chemical involved in each incident shows that in 18 % (n=40) of cases the chemical involved is unknown (figure 3). For each incident where a chemical has been described, it has been placed in a group of chemicals with similar characteristics. During the reporting period products of combustion (26 %, n=60) were the most commonly reported chemical release followed by asbestos (11 %, n=25) organic compounds and halogens (each 9 %, n=20).

8. Figure 4 shows the quarterly trend in chemicals involved in incidents reported between January and September 2005. Incidents involving products of combustion (fires) or an unknown substance were increased in quarters 2 and 3 compared to the first three months of 2005. The number of incidents involving organic compounds and metals were approximately 5% and 10% greater respectively, in quarter two compared to quarters one and three. Incidents that occurred in quarter 3 involving carbon monoxide, cyanides, CS gas, natural gas, pesticides, alkali and VOCs are not disaggregated from other chemicals due to the small number reported.

[1] http://www.uwic.ac.uk/new/research/national_focus.asp

Regional distribution of chemical incidents

9. During the reporting period 22 % (n=45) of incidents were in London (figures 5), 17 % (n=38) in the South East, 16% (n=35) in the South West and 10 % (n=21) of incidents in the West Midlands. A Government Office Region was allocated to all incidents included in the analysis for this reporting period.

10. Figure 6 shows the trend in the geographical distribution of chemical incidents reported to CHaPD, across the three quarters of 2005. Approximately 60% of all incidents reported to the division occur in London and the South of England. Between 12-15% of incidents are reported in the West Midlands. This observation accompanied with comparatively low reporting rates in Northern England and Wales suggest ascertainment bias. The Department of Trade and Industry report states that North England contains more business clusters including chemical, plastics, aerospace and metal industries than the South (http://www.dti.gov.uk/clusters/map/) and the low rate of chemical incidents may be attributed to a number of factors including an inherently low number of incidents in that region, under-reporting or differences in applying the definition a chemical incident. The figures show that reporting rates can fluctuate between the three quarters and a comparison between data collected in 2005 with that collected between 1999 and 2004 will be undertaken to see if this trend is consistent with previous years.

Chemical incident location type

11. The most frequently reported location types (figure 7) were industrial (23 %, n=50), commercial (17 %, n=37) and residential (12 %, n=40). Educational premises were involved in 3 % (n=7) of chemical incidents. Location type was unknown in 24 % (n=53) of incidents.

Number of casualties and fatalities from chemical incidents

12. Figure 8 shows that, of 219 chemical incidents, 17 % (n=38) reported 1-10 people exposed to the chemical hazard. In 72 % (n=157) of chemical incidents it was not reported how many people were exposed. No one was reported to having been exposed to a chemical agent in 5 % (n=12) of incidents.

13. The number of people with symptoms ranges from 1-10 in 5 % (n=12) incidents, no-one showed symptoms in 10 % (n=21) incidents (figure 8). In 84 % (n=183) of chemical incidents it was not known how many people showed symptoms of exposure to a chemical hazard.

14. During the reporting period fatalities were reported at three incidents, including the terrorist bombings in London. This incident is discussed in further detail in **Annex II.**

Recommendations

15. Future quarterly reports will incorporate data collected from the Fire Service, Environment Agency and National Chemical Emergency Centre and the report will be available in January 2006.

16. In addition to the next quarterly report a summary of acute chemical incidents in 2005 will be reported in late spring 2006.

17. CHaPD is recruiting a Surveillance scientist whose main responsibilities will be to undertake:

    i) Retrospective analysis of incidents in which the location of chemical involved was unknown or not certain.
    ii) Retrospective analysis of a 10% sample of incidents in order to more accurately quantify exposure, morbidity and mortality.
    iii) Investigations into the primary and secondary causes of acute incidents
    iv) Mapping of incidents using GIS to identify potentially exposed populations for future tracking.

Post script

18. On Sunday 11th December 2005, the HPA were notified of an explosion at Buncefield oil depot near Hemel Hempstead. The HPA, through its local Health Protection Units, advised the emergency services on health protection measures. In addition to the ongoing surveillance of air quality and environmental sampling being co-ordinated by the HPA, CHaPD also plan to:

    i) Map out, using GIS, sampling data taken in the first days of the fire for the purposes of exposure assessment (**see annex IV**)

    ii) Quantify the cost to the Health Service due to the Buncefield oil depot fire.

    and

    iii) Quantify the cost of the incident to the HPA in terms of staff and capital expenditure.

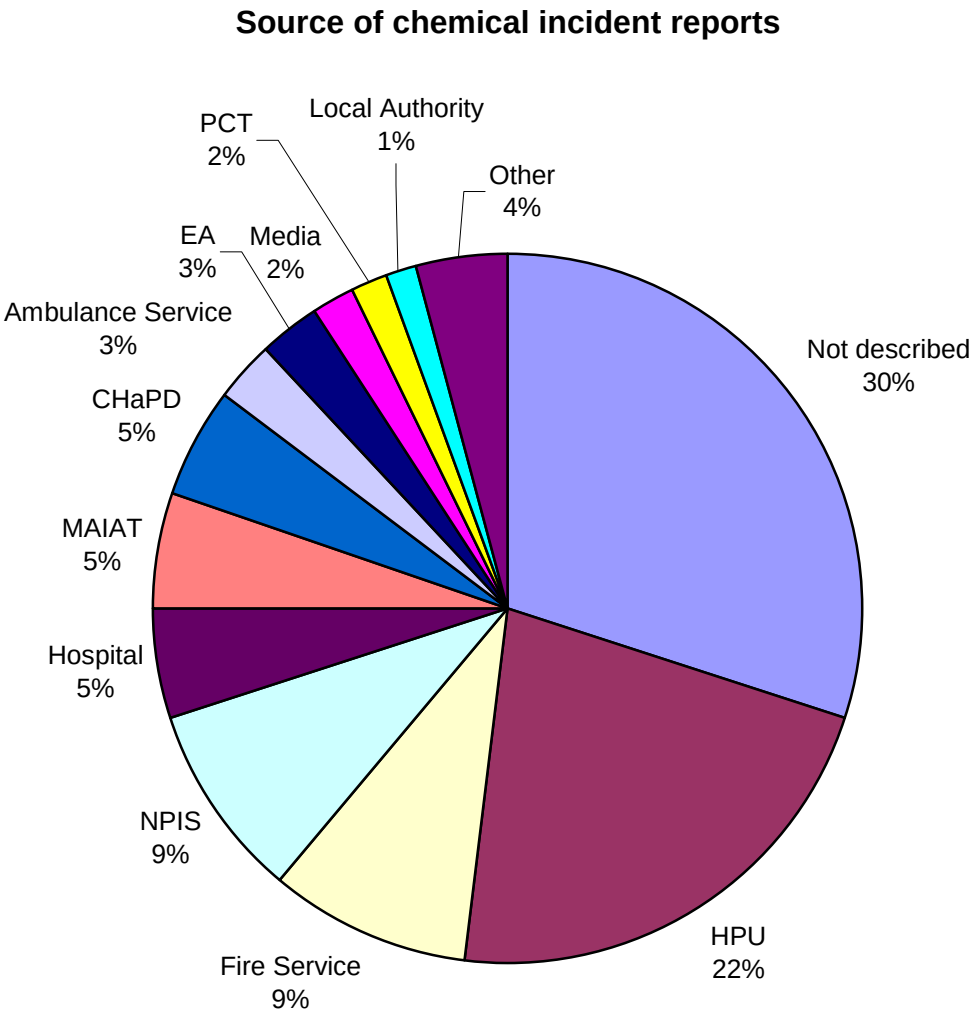

Figure 1 Notifying organisation of chemical incidents reported between 1st July and 30th September 2005 (n=219). Abbreviations: Chemical Hazards and Poisons Division (CHaPD), Environment Agency (EA), Health Protection Unit (HPU), Multi Agency Initial Assessment Team (MAIAT), National Poisons Information Service (NPIS), Primary Care Trust (PCT), Other includes Regional Resilience, General Practitioner and Police

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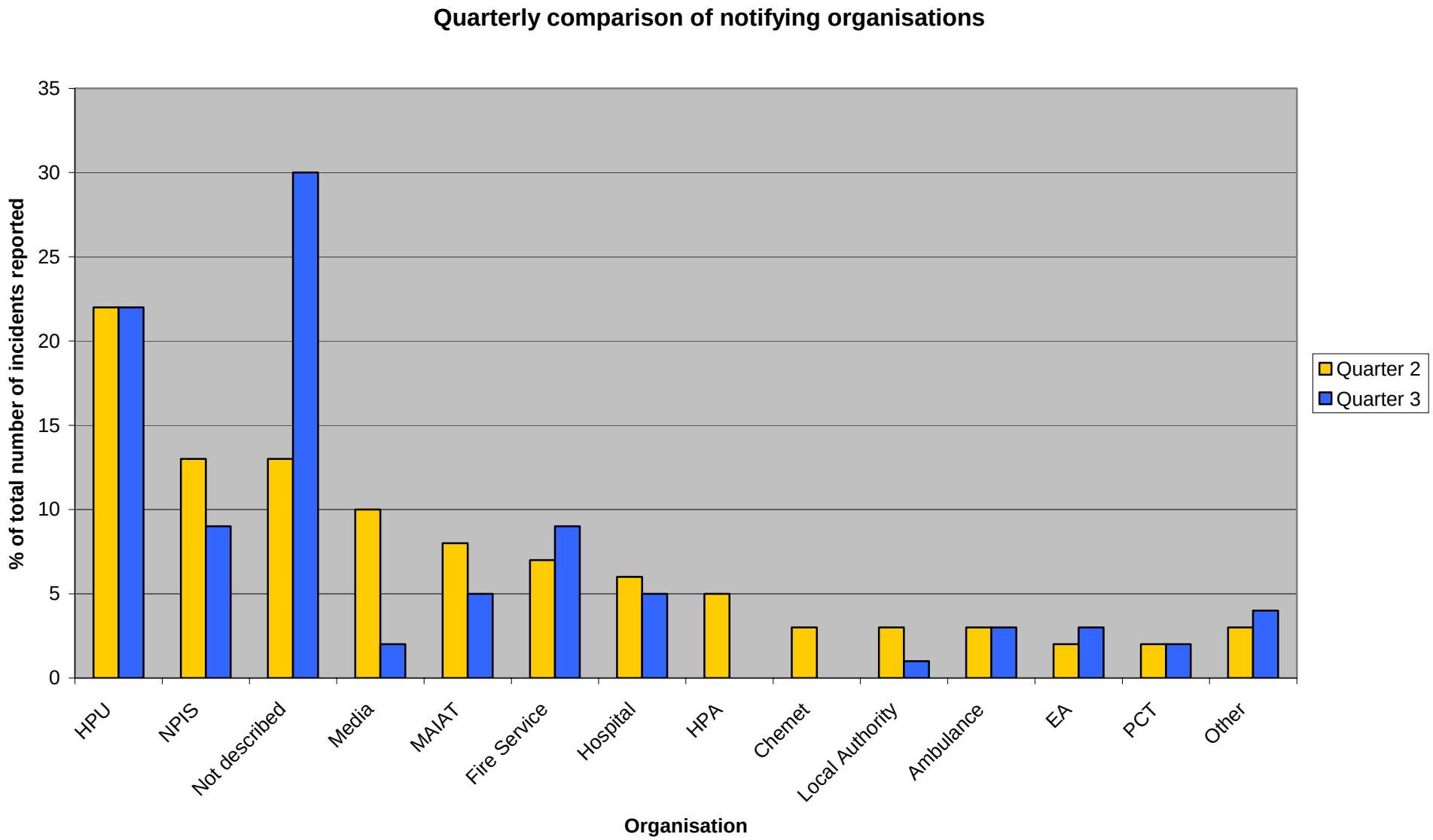


Figure 2 Notifying organisation of chemical incidents reported between 1st April and 30th September 2005 (quarter 2 n=327 and quarter 3 n=219). Abbreviations: Chemical Hazards and Poisons Division (CHaPD), Environment Agency (EA), Health Protection Unit (HPU), Multi Agency Initial Assessment Team (MAIAT), National Poisons Information Service (NPIS), Primary Care Trust (PCT), Other includes Regional Resilience, General Practitioner and Police

Incident by chemical group

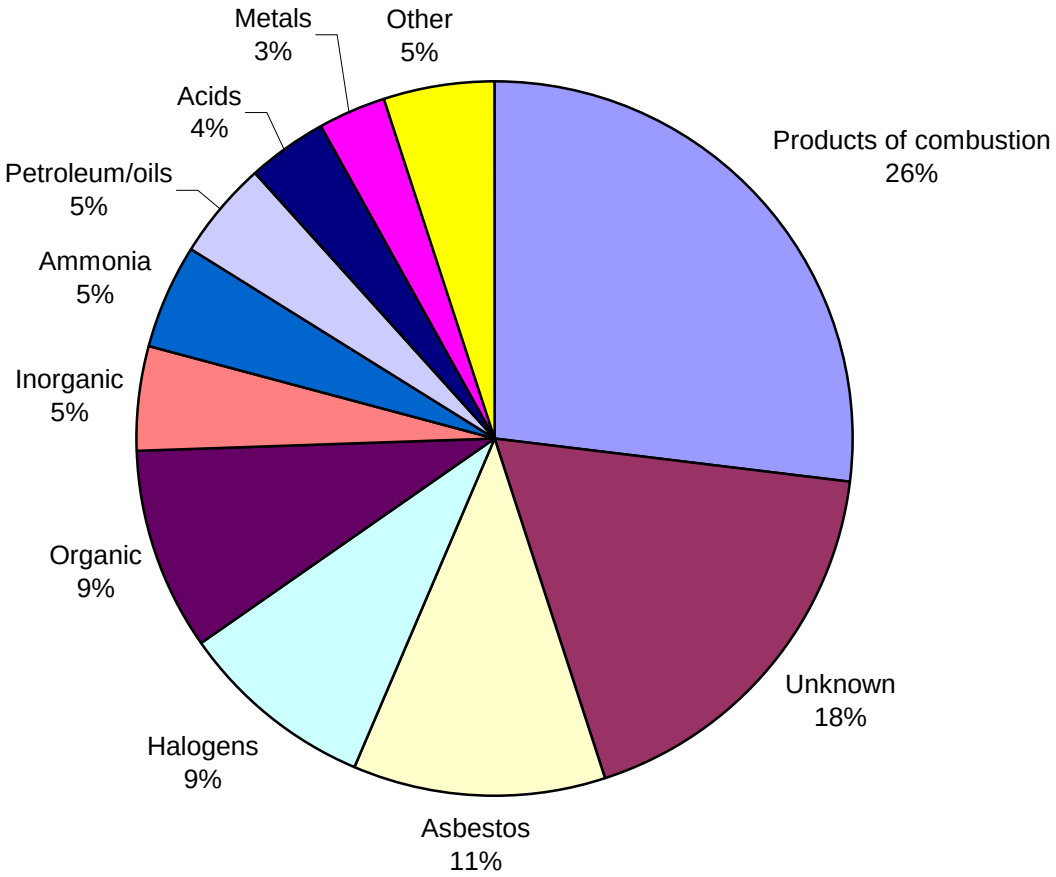


Figure 3 Chemicals involved in incidents reported between 1st July and 30th September 2005 (n=219).

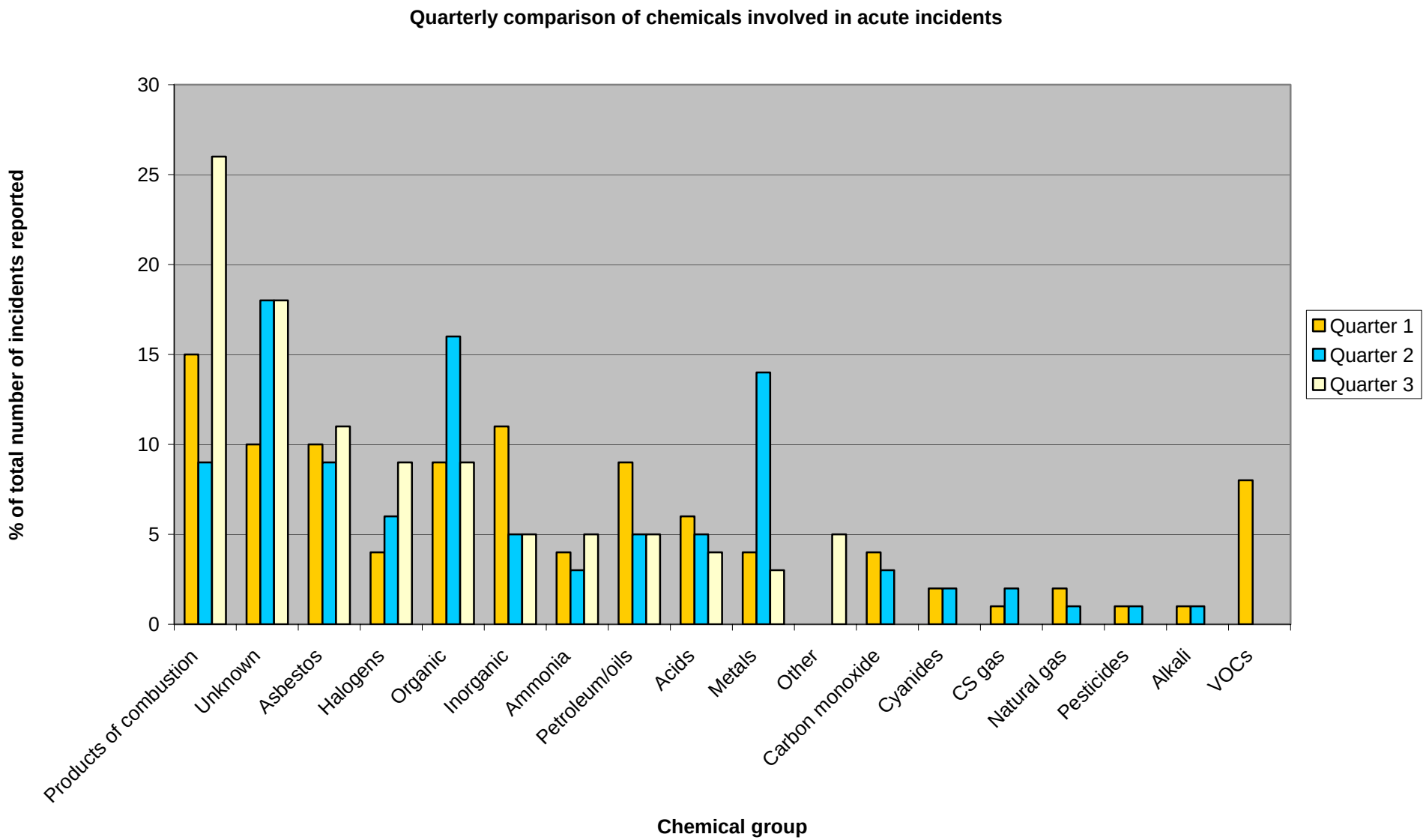
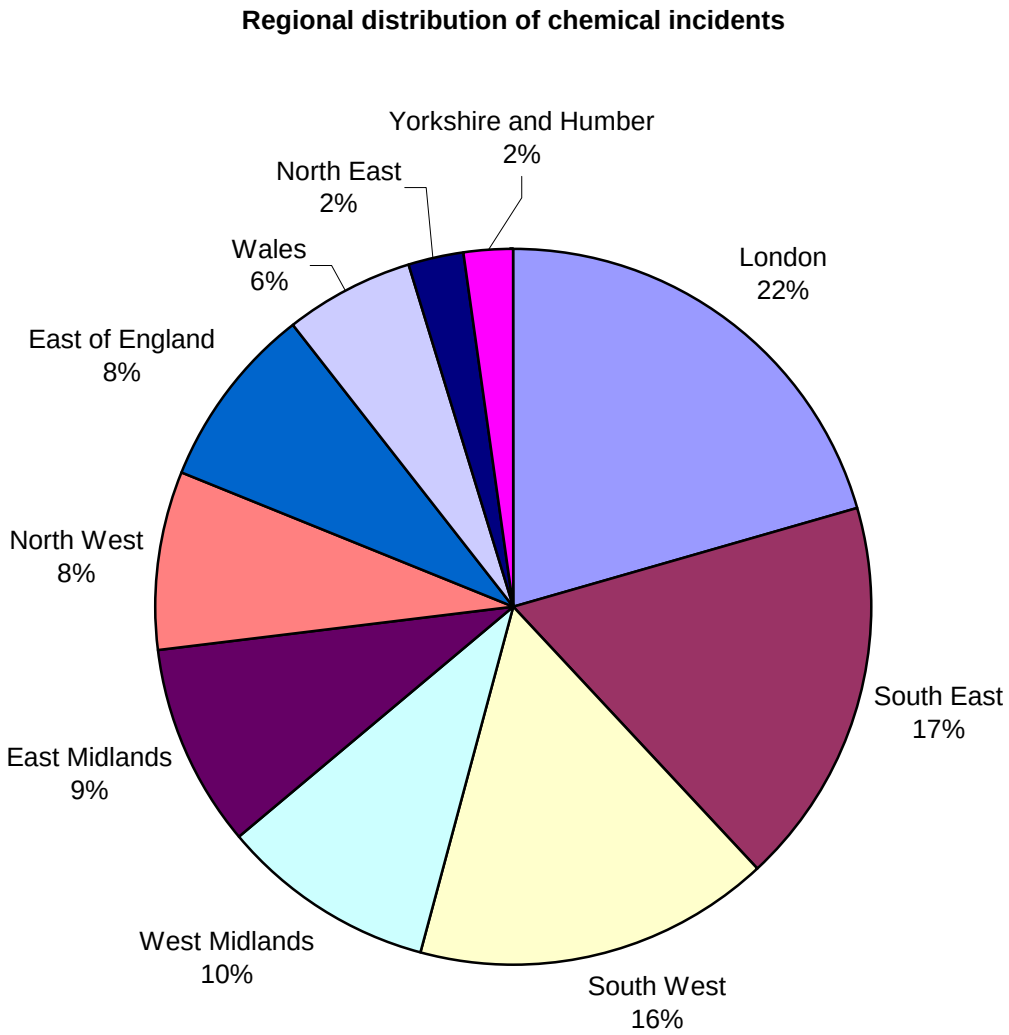


Figure 4 Chemicals involved in incidents reported between 1st January and 30th September 2005, (quarter 1 n=137, quarter 2 n=327 and quarter 3 n=219).



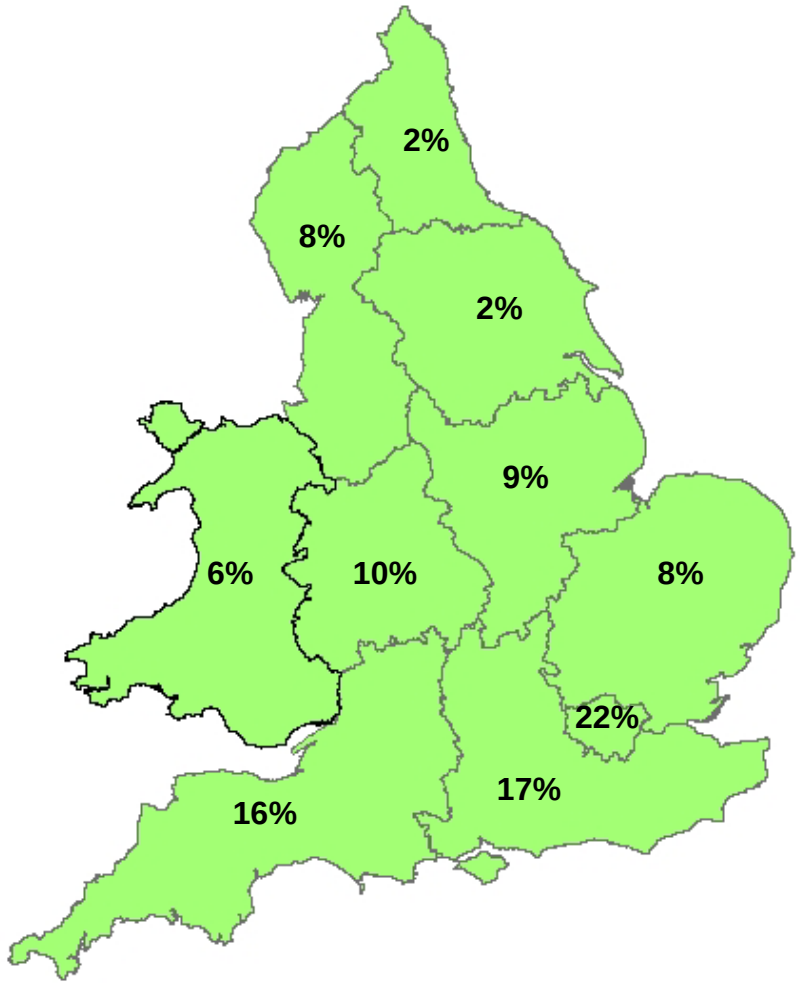


Figure 5 Regional distribution of chemical incidents reported in England, Wales and Ireland between 1st July and 30th September 2005 (n=219). One incident reported in Northern Ireland < 1%.

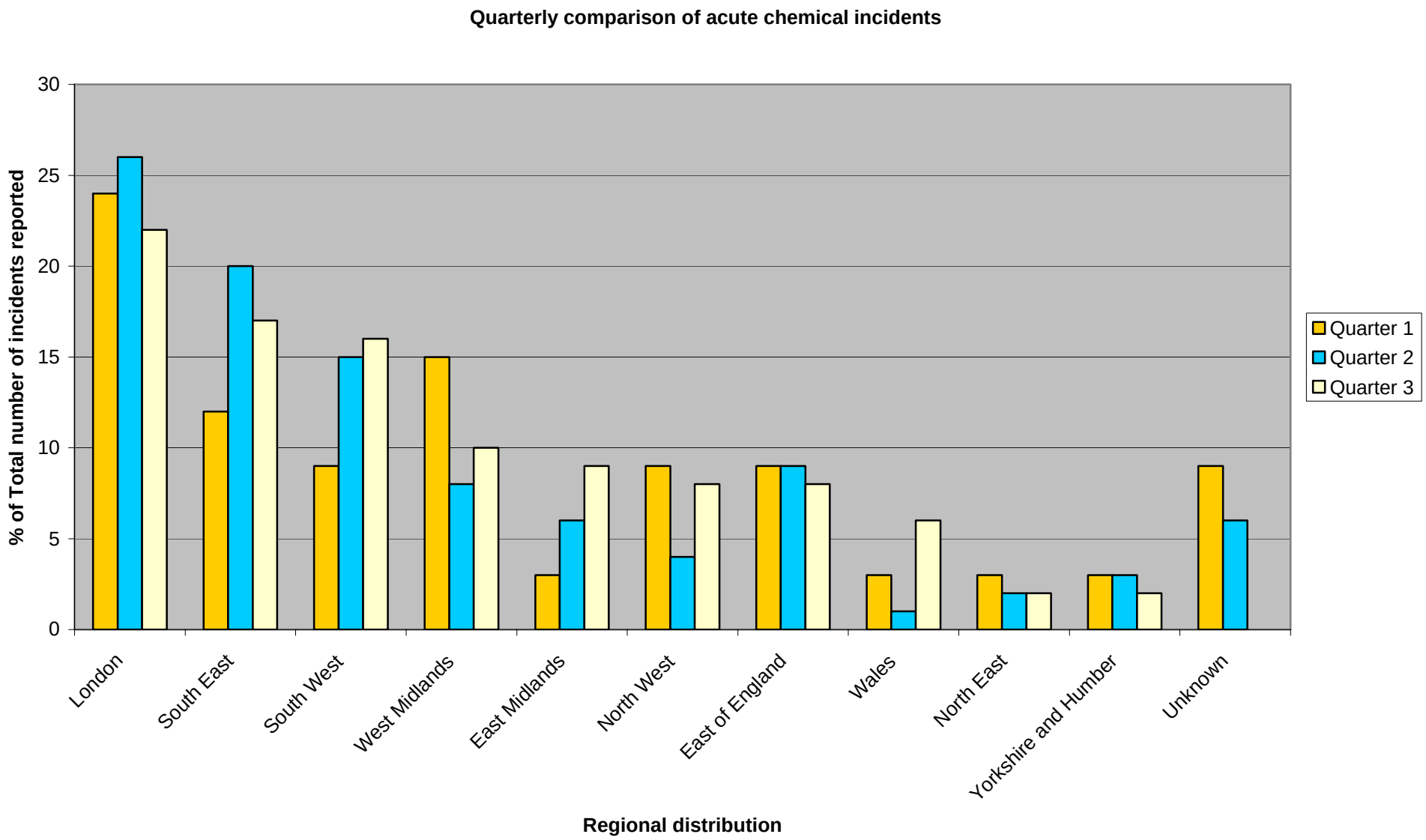


Figure 6 Regional distribution of chemical incidents reported in England, Wales between 1st January and 30th September 2005, (quarter 1 n=137, quarter 2 n=327 and quarter 3 n=219). One incident reported in Northern Ireland < 1%.

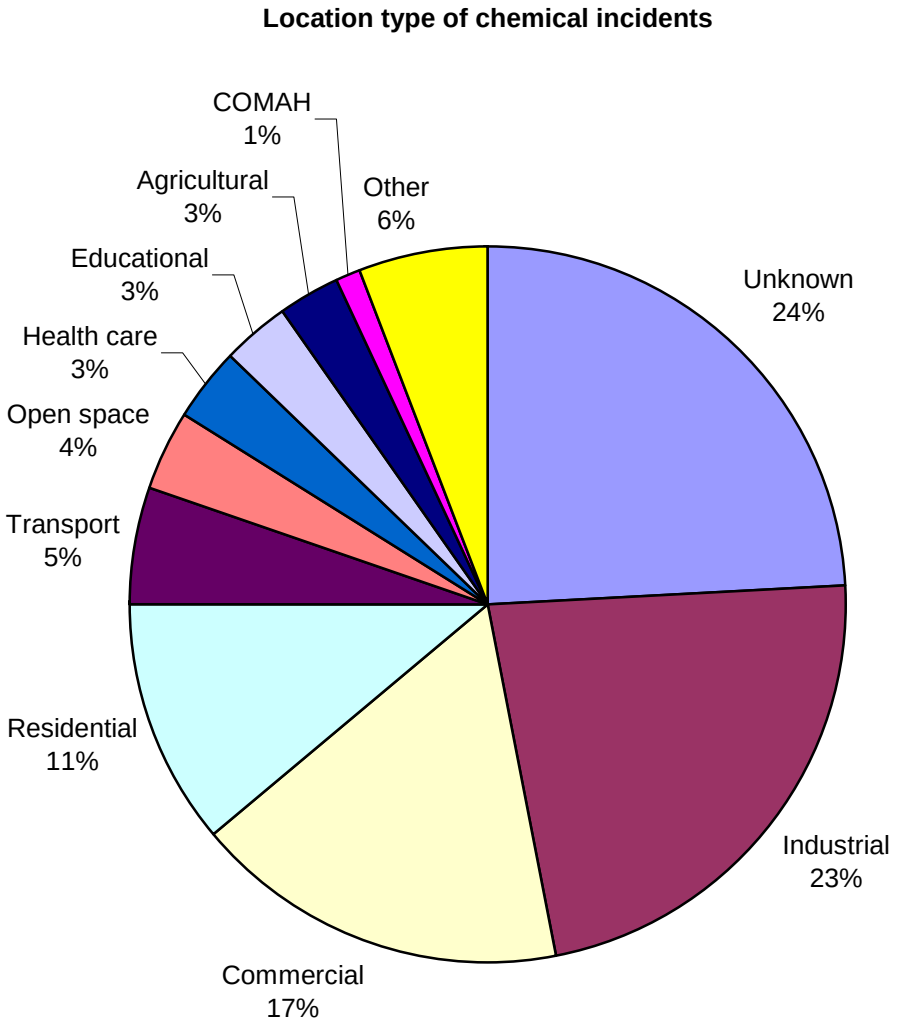


Figure 7 Chemical incident location type for chemical incidents reported in England, Wales and Ireland between 1st July and 30th September 2005 (n=219).

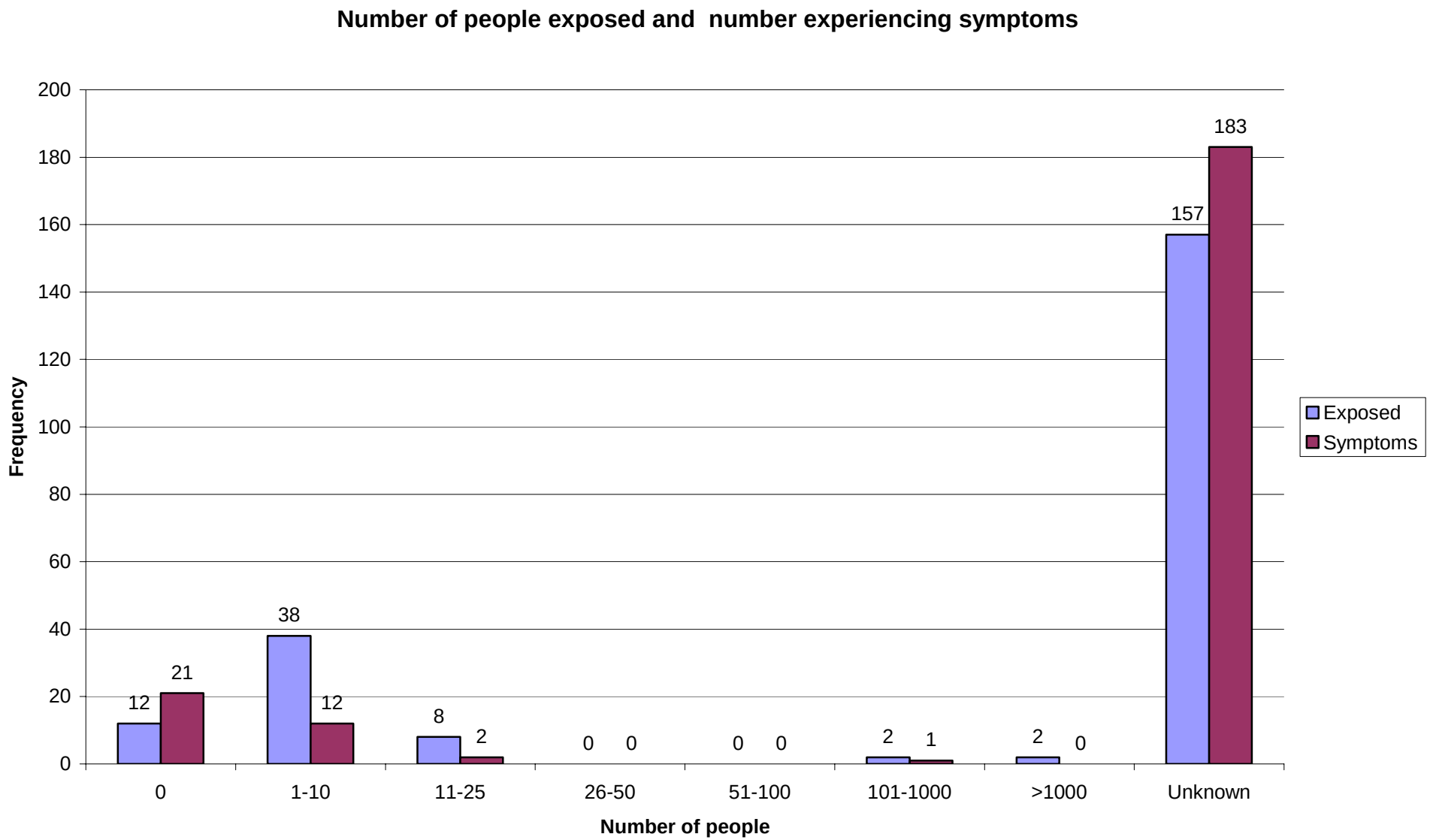


Figure 8 Number of people exposed and experiencing symptoms from a chemical incident reported between 1st April and 30th June 2005 (n=327).

Annex I

Number Incidents removed	Example brief descriptions of incidents	Reason for removal	Incident identification number(s)
21	Limited information available	Unsubstantiated	4270, 4276, 4304, 4307, 4312, 4321, 4346, 4350, 4358, 4360, 4362, 4384, 4396, 4516, 4542, 4683, 4710, 4719, 4722, 4724, 4738
15	Disposal advice, toxicity advice, air management area declared	Information	4282, 4403, 4492, 4583, 4588, 4592, 4643, 4660, 4662, 4706, 4739, 4747, 4750, 4753, 4764
12	Former gas works Contaminated land enquiries	Chronic	4252, 4302, 4308, 4349, 4432, 4480, 4493, 4657, 4658, 4708, 4728, 4742
9	Suspect packages, stolen/missing substances	Potential	4253, 4258, 4264, 4277, 4286, 4440, 4513, 4590, 4718
3	Pesticide, preservative and ammonia exposure at work	Occupational	4619, 4668, 4682
3	Explosions in London	Duplicate	4344, 4369, 4370
1	Exercise in Surrey	Planning	4778
1	Two factories on fire Malta	Abroad	4776
1	Contaminated amphetamine	Drugs	4246

Table 1 Chemical incident reports removed.

Annex II

Public health register of those exposed to the London explosions

As part of the overall public health response to the London explosions on 7 July, the Department of Health has accepted the Health Protection Agency's (HPA) plan to establish a register of those people who were physically exposed to the effects of the explosions and the emergency response which followed.

Based on the information we have available, the assessment of the risk of long-term adverse health effects arising from exposure to chemicals or blood in this incident is low. However we need to be able to monitor the health of those involved in order to reassure them that this assessment is correct.

Inclusion on the Register will be entirely voluntary, and consent for inclusion and subsequent follow up will be sought through the individuals' General Practitioners. Initial information on those exposed will be collected from a variety of sources where people will have sought advice and treatment following the explosions. The follow up of these individuals will then provide further information about their exposure and subsequent health.

This information contained on the Register will allow us to provide further advice should on-going risk assessments highlight such a need, and the register will also allow us to carry out longer-term follow-up to assess the health impact of such incidents.

The longer-term health issues that the register will allow us, or others, to monitor include the effects of the inhalation of smoke, the psychological impact, and the risks of hepatitis B and C following exposure to blood. It should be stressed that there is no evidence that any unusual chemicals were involved in the explosions on the Underground, however environmental sampling, alongside the ability to monitor those listed on the register for any common symptoms, will help us identify anything that was not apparent from investigations undertaken immediately after the explosions.

The management of the Register will be overseen by a Steering Committee, including representatives from the Department of Health, the National Health Service, the Health Protection Agency, the Emergency Services and London Transport. All details on the register will be handled in strict confidence and access to the database will only be for specialists carrying out analysis.

Reference: http://www.hpa.org.uk/explosions/health_register.htm

Annex III

Chemical Hazards and Poisons Division

Definition of a Chemical Incident

National Database of Chemical Incidents

REVISED DATA SPECIFICATION AUGUST 2005

Definition of incident

All incidents representing "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" should be included in the National Database. All incidents with an off-site impact are to be included, as well as on-site incidents where members of the public are affected. (For the purposes of the definition, hospital staff and emergency services personnel should be regarded as members of the public).

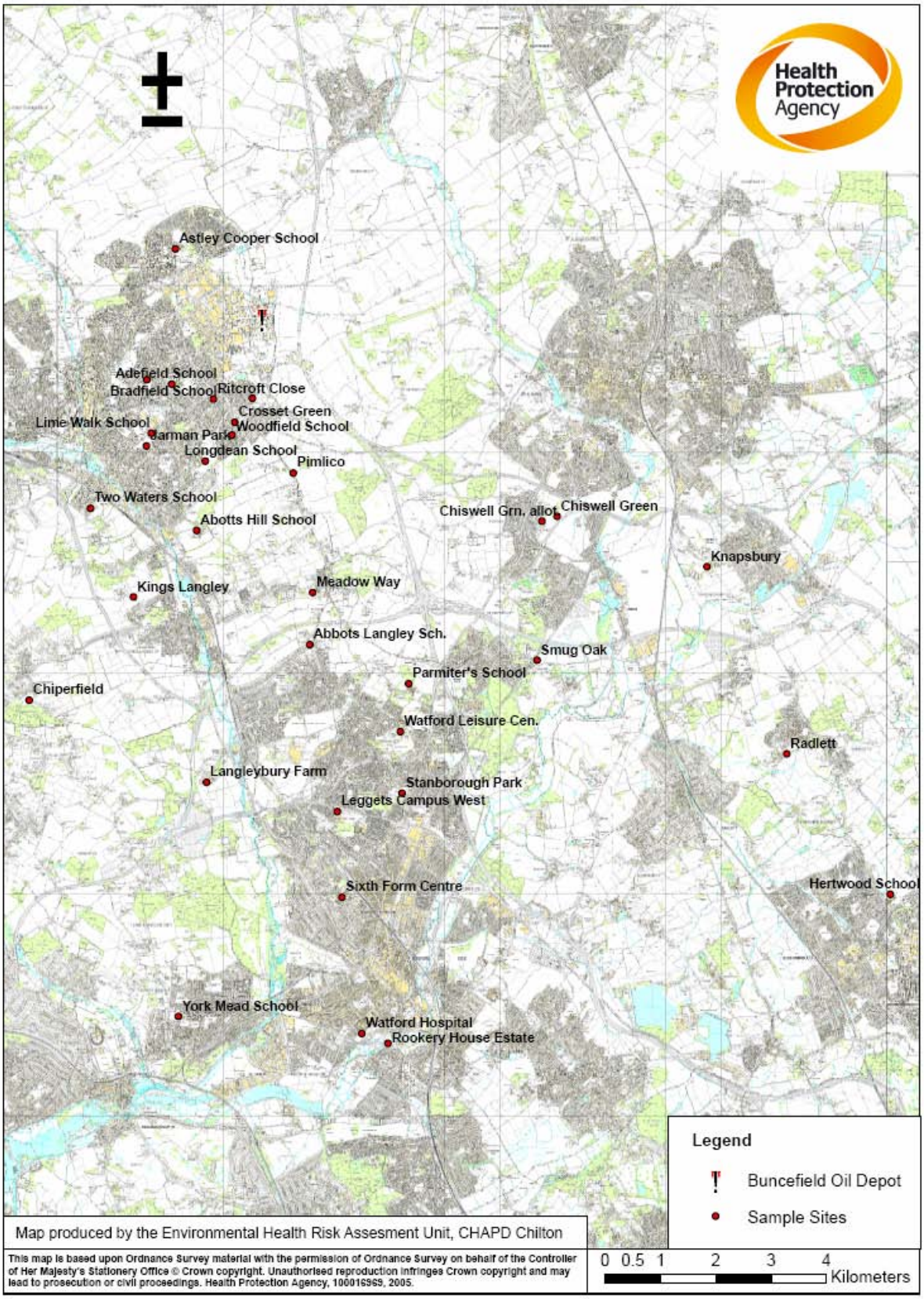
Examples of incidents to be excluded from national surveillance include:

- Occupational exposure with no potential for public exposure, e.g. a small spill at a factory in which only employees are exposed.
- Food contamination incidents with no potential for public exposure.
- Incidents involving non-ionising radiation.
- Accidental childhood poisoning, e.g. the ingestion of bleach.
- Incidents involving drugs and other substances of abuse.
- suicide attempts not involving chemicals

By way of contrast, the following incidents should be included:

- Cases of non-intentional gas poisoning.
- All workplace incidents with an off-site impact, as well as on-site incidents where members of the public are affected. (For the purposes of the definition, hospital staff and emergency services personnel should be regarded as members of the public).
- Spills of chemicals in a school laboratory, resulting in the admission of pupils to hospital or exposure of staff or pupils.
- Potential chemical terrorism events
- Deliberate contamination of food or water supplies

Those incidents, for which there is uncertainty over whether they should be included in the National Database, should be included, and any difficulties associated with the definition drawn to the attention of the Database Audit Group. By doing so, an informed review of the definition can occur, and incidents can be subsequently deleted from the database if necessary.

Annex IV

Location of environmental sampling points following Buncefield Oil Depot fire, over OS 1:10 000 scale mapping