

Chemical Hazards and Poisons Division

Public Health Surveillance of Chemical Incidents



Surveillance report 1st January – 30th June 2007

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

The national Chemical Incidents Surveillance System (CISS) for England and Wales is maintained by the Chemical Hazards and Poisons Division (CHaPD) of the Health Protection Agency (HPA). All chemical incidents reported to the HPA are recorded in the on-line system and those for the period 1st January – 30th June 2007 have been extracted from the database for analyses.

The Division is continuously striving to improve the data ascertainment and utility of the database through an ongoing programme of many initiatives/projects. The key findings for the first six months of 2007 include:

- An estimated 2.2 million people lived within 1km of reported uncontained chemical incidents in England and Wales including over an estimated 544000 children (0-19 years).
- 443 chemical incidents were managed and recorded on the database. Forty-four (44) incidents were excluded as duplicates, exercises or as not meeting the CHaPD definition of a chemical incident and four (4) were not located in England or Wales.
- Of the 443 reported incidents included in the analyses in this report, 313 were designated 'actual', 95 'potential' and 35 for 'information'.
- There were five fatalities resulting from four separate acute chemical incidents reported in this period. 238 reported acute incidents resulted in an estimated 1193 - 8110 people being exposed and in a reported 146 incidents an estimated 226 - 1580 people showed symptoms. During two further incidents in excess of 1000 people were estimated to have been exposed in each. The estimation of population exposure was 80% (n=355), an improvement from the same period in 2006 when it was 66% (n=292). Evacuation was reported in 33% (n=145) of incidents.
- The chemical group most frequently identified was products of combustion (32%, n=145) with 94% being designated as fires. This is followed by other organic chemicals (11%, n=49) and other inorganic chemicals (9%, n=42).
- For the reporting period, chemical incidents were most frequently reported in London (37%, n=168), followed by the West Midlands (13%, n=57) and then by the South East (10%, n=45).
- The most common sources of reports for chemical incidents (notifying organisation) were National Poisons Information Service (30%, n=131) followed by

Health Protection Units (14%, n=60) and the Ambulance and Fire Services (12%, n=54 and 52 respectively).

Introduction

1. This report summarises the distribution and characteristics of chemical incidents recorded in the on-line database¹ between the 1st January and 30th June 2007.
2. Incidents are classified as **actual** (an incident which has occurred and in which a chemical with the potential to cause harm to human life was released into the environment), **potential** (an event which could result in the exposure of the public to chemical substances and endanger public health), for **information** (general enquiries for factual material, advice or data not relating to a specific chemical incident) and **exercises**.

Box 1: 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).

Results

3. After screening for duplicates (n=4), exercises (n=12), incidents outside the geographical region of England and Wales (n=4) and incidents not meeting the definition (n=28) given in Box 1, 443 acute chemical incidents were recorded for the period 1st January through to 30th June 2007 in England and Wales. The results of the analyses of the characteristics of the chemical incidents for the period are outlined in the sections below.

Exposure, morbidity and mortality associated with chemical incidents

4. An estimated 1193-8110 people were exposed as a result of 238 reported chemical incidents. Two separate events in the South West region involved the estimated exposure of more than 1000 people (in each case) to chemicals in the water supply. Figure 1 shows that 1-10 people were reported as being exposed to a chemical hazard in 49% (n=216) of the incidents, that is, between 216 and 2160 people. No one was reported to have been exposed to a chemical agent in 26% (n=115) of incidents. In 20% (n=88) of chemical incidents it was not reported and impossible to impute the number of people who were exposed, an improvement on the 34% (n=150) recorded for the corresponding period in 2006 (refer to Figure 1).
5. The number of people exposed and exhibiting symptoms as a result of 146 reported chemical incidents was estimated to be 226-1580. In 40% (n=178) of reported incidents no symptoms were reported and in 27% (n=119) the number of symptomatic cases was not known (refer to Figure 2). There was a slight improvement in the reporting of morbidity status of individuals during chemical incidents for the reporting period in 2007 (73%) in comparison to same period in 2006 (70%). Figure 2 shows the comparison between the morbidity data for January - June 2006 and 2007.
6. Figure 3a shows the geographical distribution of 317 (72%) of the 443 reported chemical incidents which occurred during the reporting period, where the postcode of the incident was reported or subsequently ascertained. 159 of the 317 (60%) chemical incidents were uncontained and resulted in potential population exposure

¹ <http://chapid.fs-server.com/>

(see Figure 3b). More than 2.2 million people are estimated to live within 1km of the uncontained incidents in England and Wales.

7. Table 1 shows that more than 544000 children (0-19 years) are estimated to be living within 1km of uncontained incidents which occurred in England and Wales during this period. This suggested that one in every four person potentially exposed during a chemical incident is a child as was the case for the corresponding six month period for 2006. The regional population within a 250m, 500m, 750m and 1km radius of each incident is also shown in Table 1. On average 14000 people (within a 1km radius) was exposed to a chemical incident in this reporting period.

Table 1: Population within 250m, 500m, 750m and 1km of uncontained chemical incidents in Government Office Regions (GOR) of England and Wales.

	0-250m	250-500m	500-750m	750-1000m	Total within 1km
North East (GOR) – 5 incidents					
Population	1400	7300	11900	128000	33300
0-19 years	300	1900	3200	3500	9000
North West (GOR) – 6 incidents					
Population	4500	9700	14800	19900	48900
0-19 years	900	2400	3700	4800	11700
Yorkshire & Humber (GOR) – 6 incidents					
Population	800	4000	7000	10300	22000
0-19 years	200	1000	1700	3000	5900
East Midlands (GOR) – 13 incidents					
Population	6300	16100	24300	34200	81000
0-19 years	1500	3900	5700	8500	19700
West Midlands (GOR) – 21 incidents					
Population	9800	37000	60700	92500	200000
0-19 years	2800	10600	18400	28900	60700
East of England (GOR) – 7 incidents					
Population	3100	7400	11400	17800	39800
0-19 years	80	1800	2800	4200	9600
London(GOR) – 75 incidents					
Population	116600	307500	529200	708400	1661700
0-19 years	28600	73500	128000	168600	398700
South East (GOR) – 9 incidents					
Population	3900	13700	15300	15000	47800
0-19 years	900	3200	3500	3400	10900
South West (GOR) – 12 incidents					
Population	4300	11600	18900	22000	57000
0-19 years	900	2400	4300	5200	12800
Wales – 5 incidents					
Population	800	4700	6600	8700	20800
0-19 years	200	1300	1700	2200	5400

Total Incidents = 159; Total population within 1km = 2.2 million; Total 0-19 years within 1km = 544000

N.B. Populations are approximated to 2 significant figures for presentation

8. There were five (5) fatalities during four (4) chemical incidents for this reporting period.

Source of chemical incident reports

9. 30% (n=131) of chemical incidents were reported by the National Poisons Information Service, and 14% (n=60) by local Health Protection Units, 12% each by the Ambulance Service (n=54) and the Fire Service (n=52). Figure 4 gives the statistics for all reporting organisations.

10. Retrospective analyses of the database have improved completion of this field to 99.8% with only one incident having the reporting organisation “not described”.

Chemicals involved in incidents during reporting period

11. Figure 5 demonstrates that during the reporting period the most frequently reported primary chemicals which were released during chemical incidents were products of combustion (32%, n=146) followed by other organic chemicals (11%, n=49), other inorganic chemicals (10%, n=45) and metals (5%, n=23). The chemical was unknown in 14% (n=61) of reported chemical incidents which is similar (14%, n=60) for the corresponding reporting period in 2006.

12. Figure 6 illustrates that during the corresponding period for 2006 the most frequently reported chemical that was released was also products of combustion but there were 19 more incidents involving its release in 2007. The proportions for the other chemical groups released during the first six months of 2006 and 2005 are generally similar.

Regional distribution of chemical incidents

13. Figures 7a shows that 37% (n=168) of incidents occurred in London, 13% (n=57) in the West Midlands, 10% (n=45) in the South East and 9% (n=38) in the South West. Table 2 shows the total number of incidents occurring in each region for the first six months of 2006 and 2007 and the proportions are indicated on the map (Figure 7b).

Table 2: Number of incidents occurring in the 9 regions of England and Wales during 1st January – 30th June 2007 and 2006.

Geographical Region	Number of Chemical Incidents	
	2007	2006
North East	12	11
North West	18	25
Yorkshire & The Humber	26	22
East Midlands	26	25
West Midlands	57	39
East of England	28	34
London	168	148
South East	45	68
South West	38	55
Wales	25	12

14. The regional geographical location for *all* incidents has been described for the reporting period.

15. Figure 8 illustrates the monthly distribution of acute chemical incidents for the reporting period.

Chemical incident location type

16. Chemical incidents were primarily reported in residential locations (27%, n=124) followed by commercial and industrial (17% each, n=81 and 74 respectively). There was no single dominating type of incident in residential locations, however, fires accounted for 66% (n=49) and 46% (n=37) of incidents occurring on industrial and commercial premises, respectively. Figure 9 shows that in 5% (n=20) of the

incidents the location was unknown. Transportation accounts for 9% (n=38) of the chemical incidents of which 47% (n=18) were classed as spills and leaks.

17. In general, there were no significant differences between the types of locations of chemical incidents for the reporting period of 2007 and 2006 (Figure 10) although there was a slight increase in incidents in residential locations for this period. The proportion of incidents in which the location type was unknown was reduced marginally from 7% for the reporting period in 2006 to 5% in 2007.

Types of chemical incidents

18. Figure 11 demonstrates that the most common type of chemical incident is fire (31%, n=139), followed by release (16%, n=71), leaks (13%, n=56) and spills (12%, n=52). This trend is similar to that observed previously for annual, quarterly and six monthly periods. The incident type was undefined for 5% (n=24) of acute chemical incidents of which 38% (n=9) occurred in London.

Future Events/Publications

19. The next six monthly review of chemical incidents is due in January and will describe the nature, distribution and characteristics of events occurring during the period July – December 2007.

20. A review for the division presenting data for 2007 and 2006 as well as describing the activities/achievements/goals of each unit (in the division) will be produced in April 2008 and launched at the CHaPD conference in May 2008.

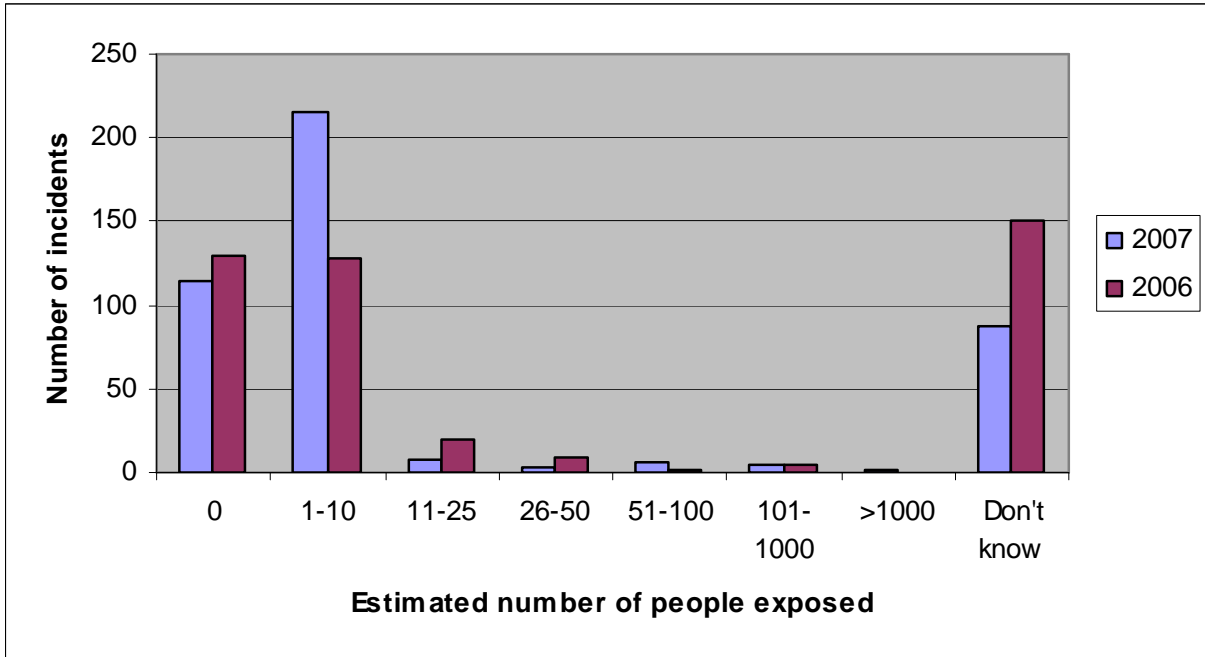


Figure 1: Number of people exposed during chemical incidents reported between 1st January and 30th June for 2007 (n=443) and 2006 (n=443).

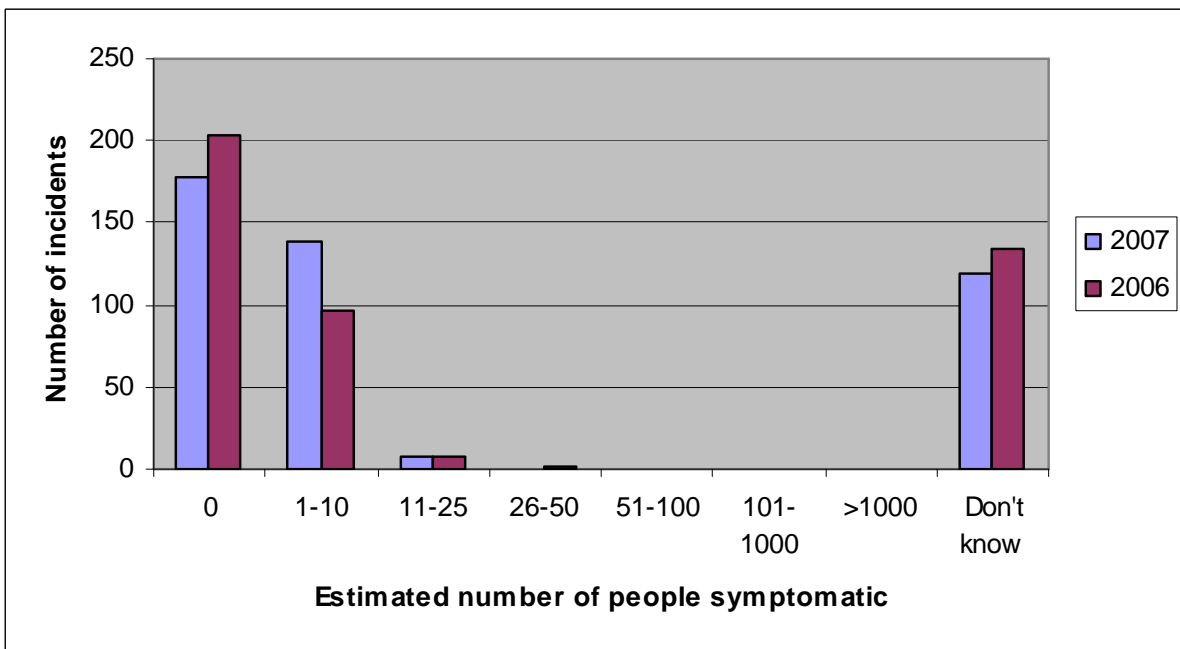


Figure 2: Number of people exposed and experiencing symptoms during chemical incidents reported between 1st January and 30th June for 2007 (n=443) and 2006 (n=443).

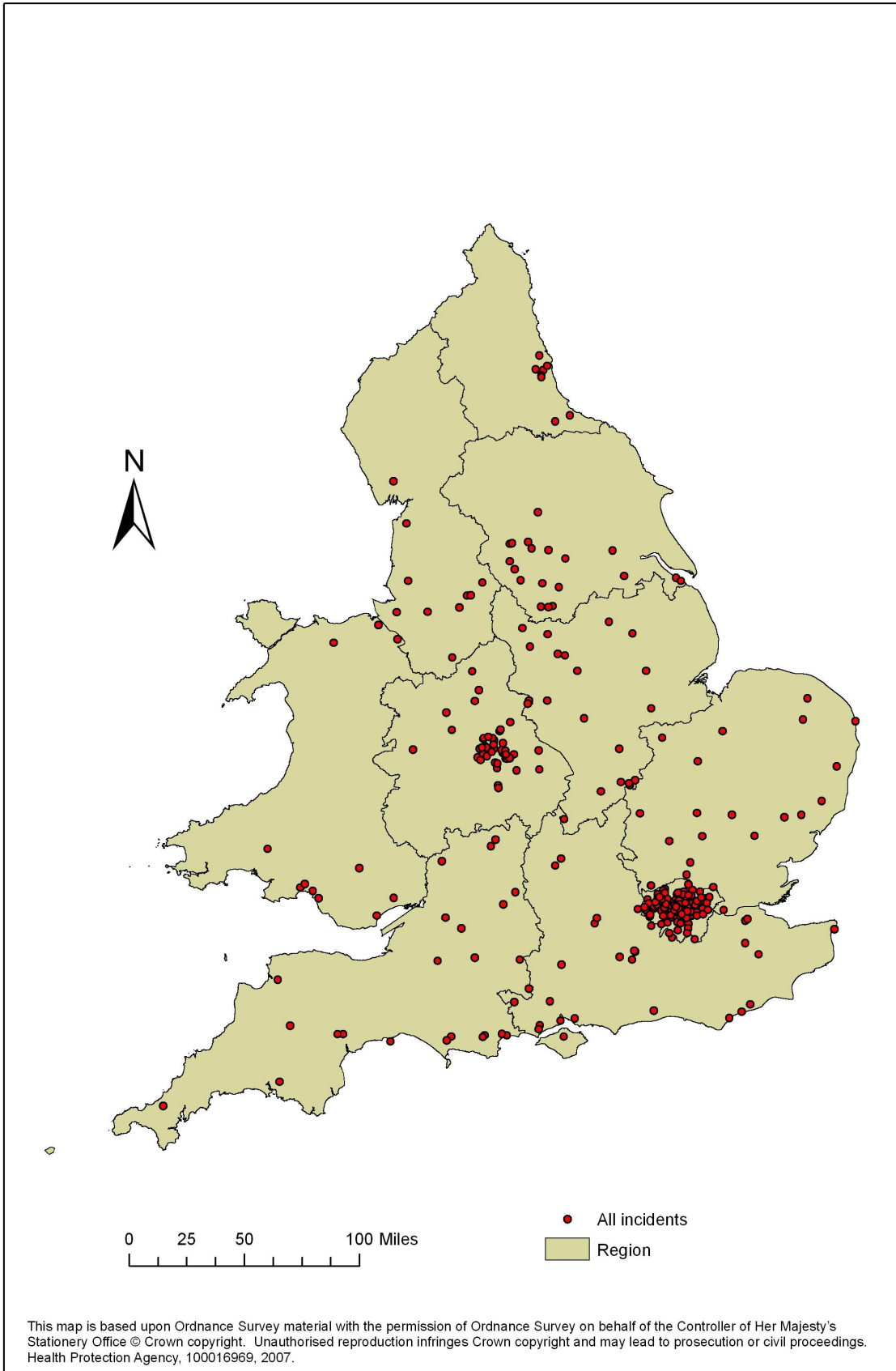


Figure 3a: Illustration of the location of 317 incidents with geographical reference which occurred between 1st January and 30th June 2007.

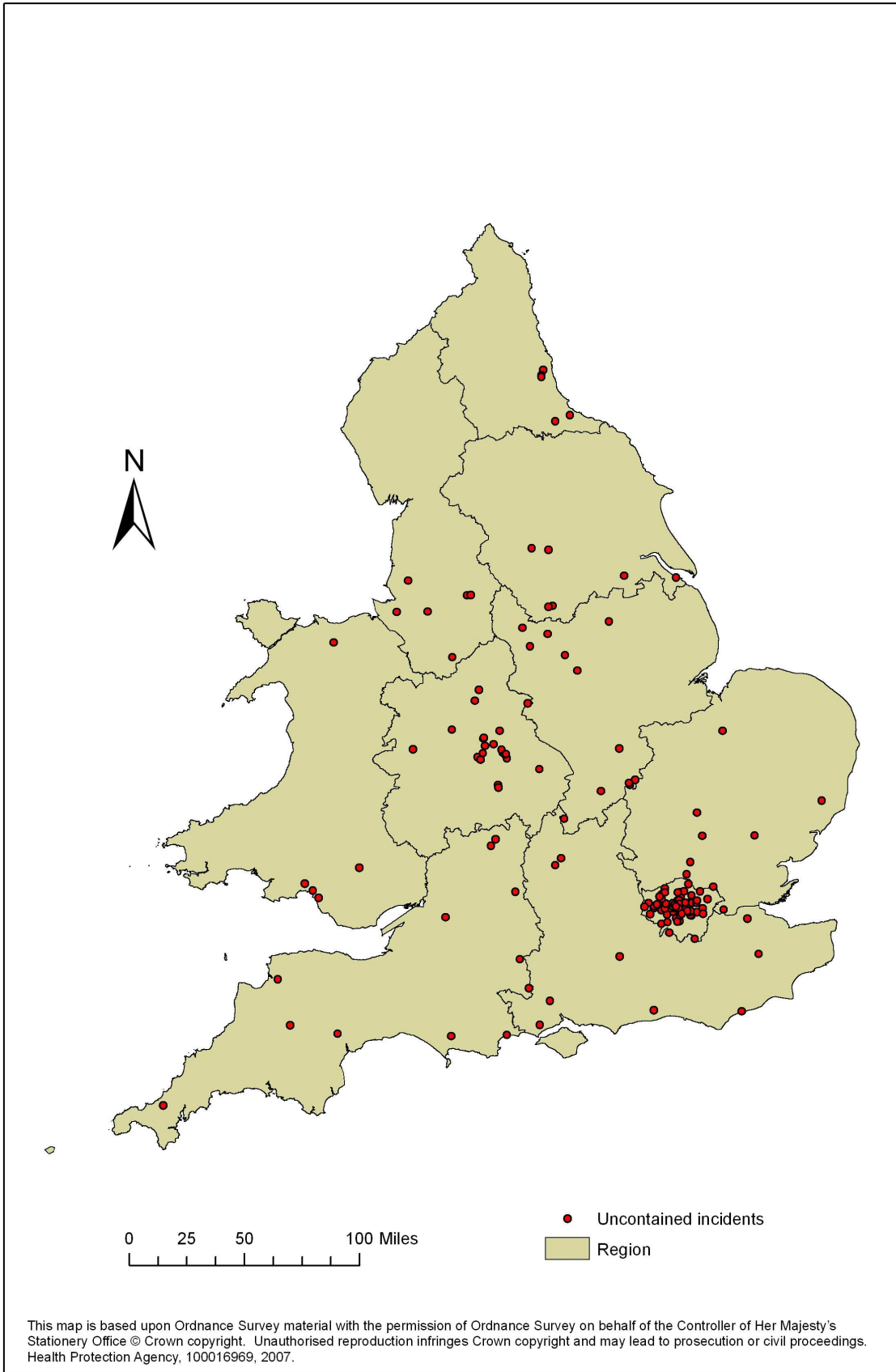


Figure 3b: Illustration of the location of 159 **uncontained** incidents with geographical reference which occurred between 1st January and 30th June 2007.

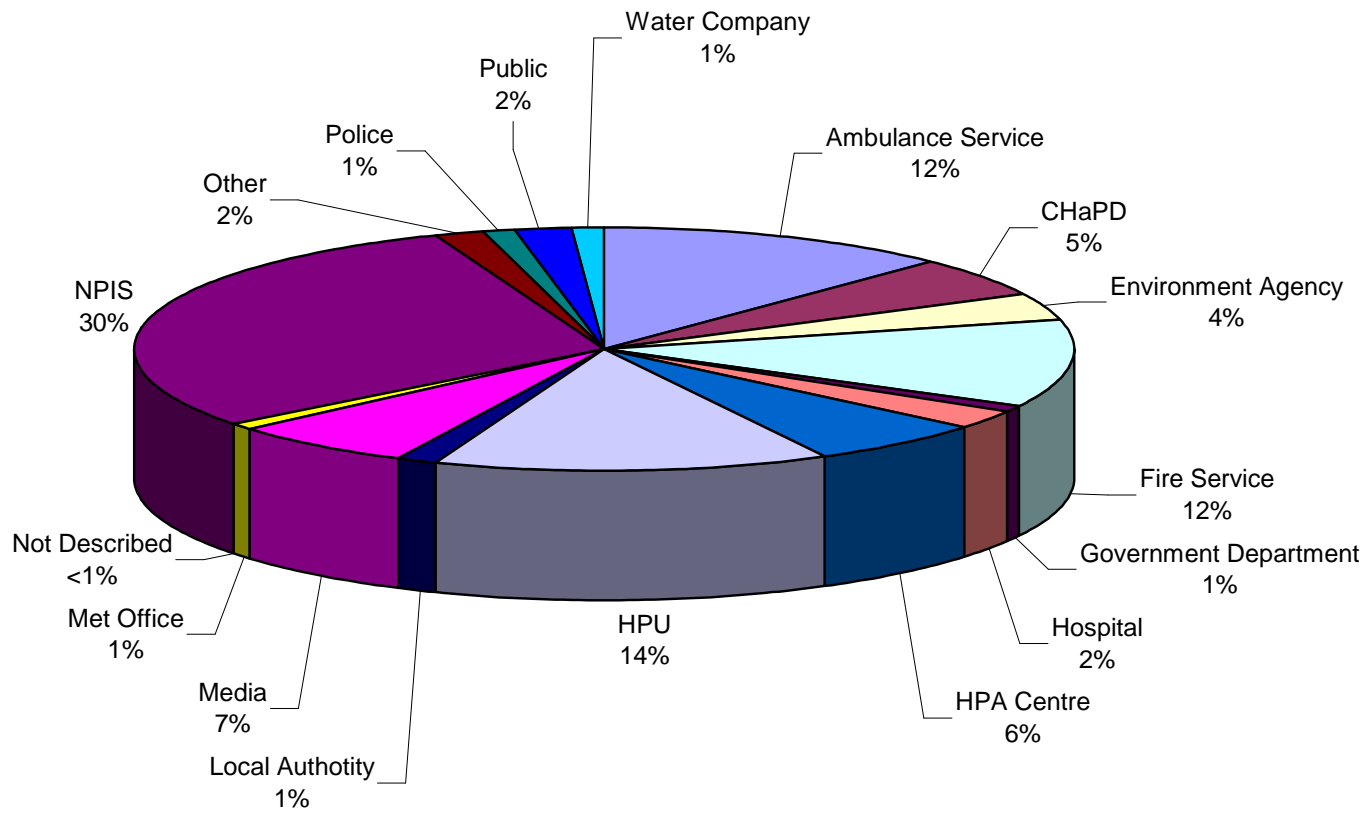


Figure 4: Notifying organisation of chemical incidents reported between 1st January and 30th June 2007 (n=443). Abbreviations: Chemical Hazards and Poisons Division (CHaPD), National Poisons Information Service (NPIS), Health Protection Agency Centre (HPA Centre). Other includes groups such as General Practitioner and Nurse practitioner.

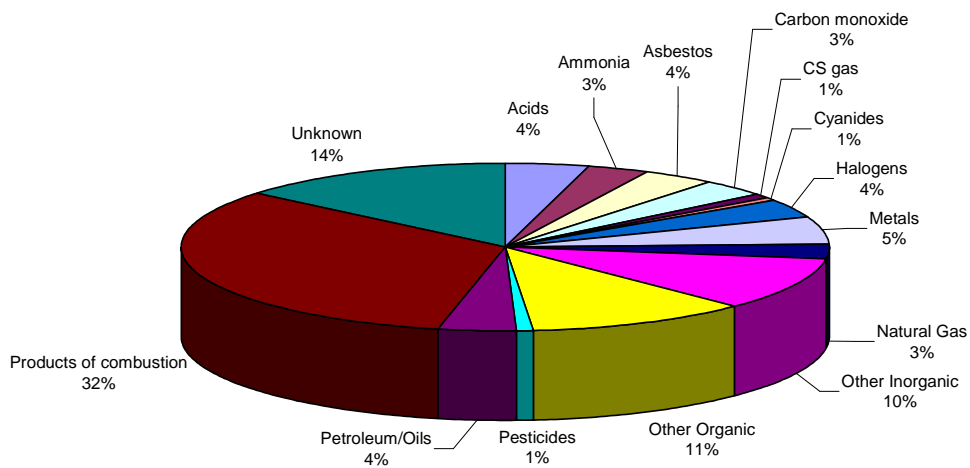


Figure 5: Chemicals involved in incidents reported between 1st January and 30th June 2007 (n=443).

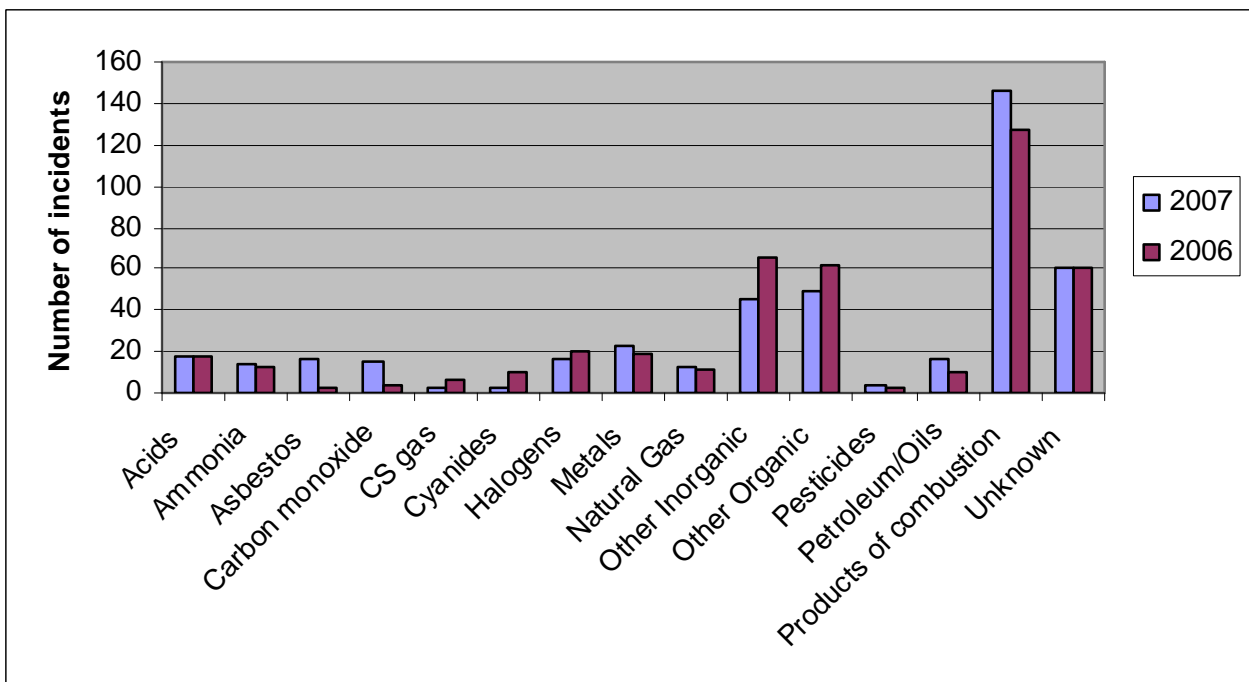


Figure 6: Chemicals involved in incidents reported between 1st January and 30th June for 2007 (n=443) and 2006 (n=443).

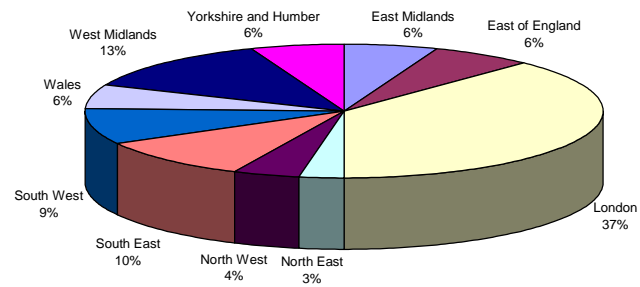


Figure 7a: Regional distribution of chemical incidents reported to CHaPD between 1st January and 30th June 2007 (n=443).

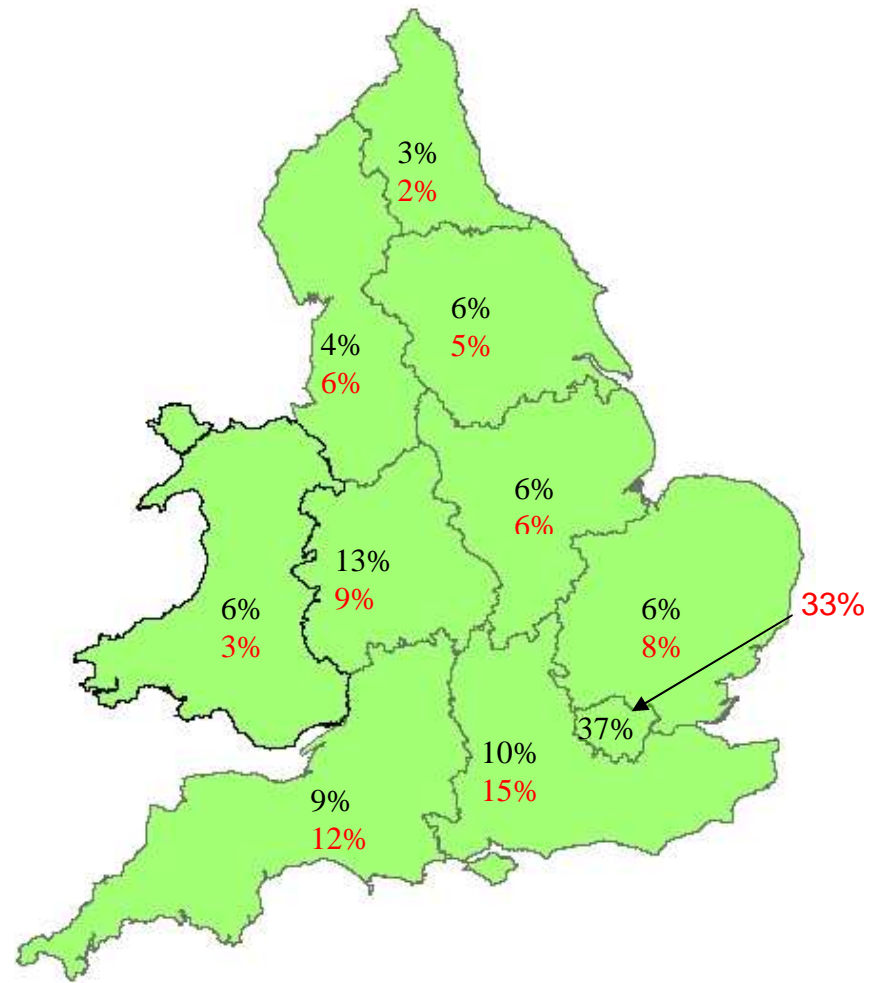


Figure 7b: Regional distribution of chemical incidents reported in England & Wales between 1st Jan. and 30th June 2007 (black font) and 2006 (red font).

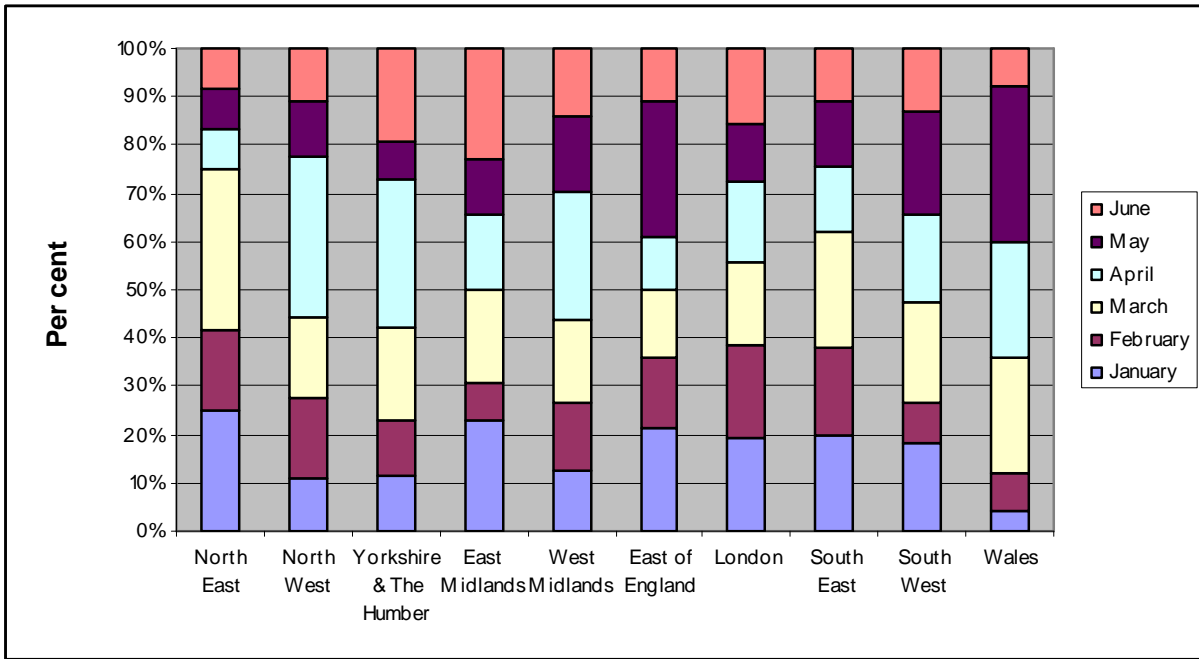


Figure 8: Temporal distribution of chemical incidents reported in England and Wales between 1st January and 30th June 2007 (n=443).

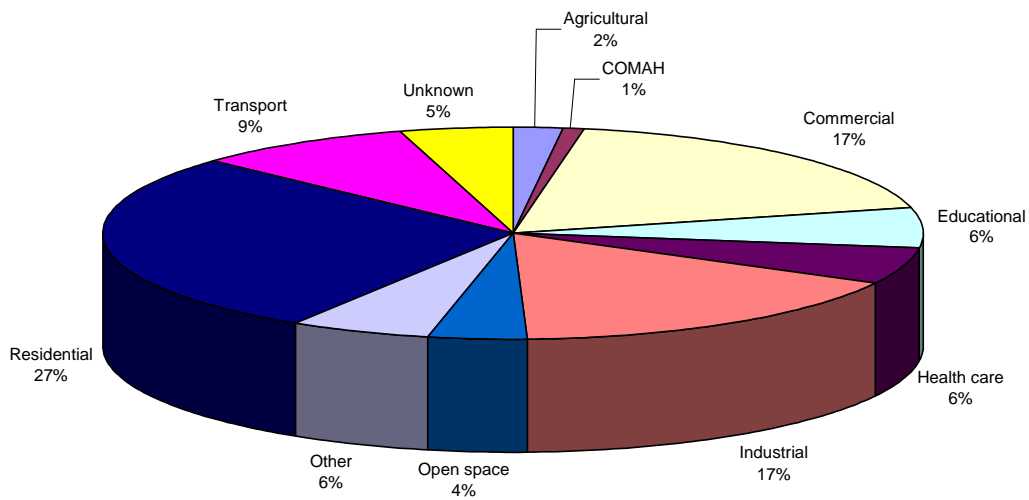


Figure 9: Chemical incident location type for chemical incidents reported in England and Wales between 1st January and 30th June 2007 (n=443).

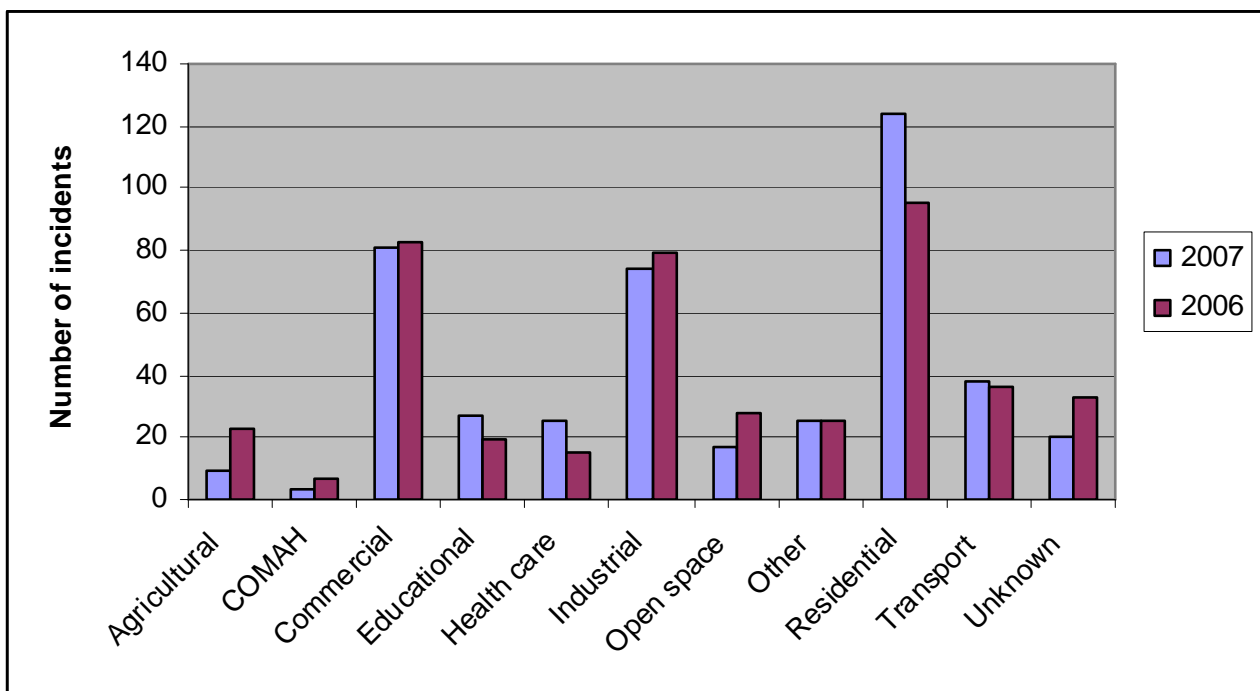


Figure 10: Chemical incident location type for chemical incidents reported in England and Wales between 1st January and 30th June for 2007 (n=443) and 2006 (n=443).

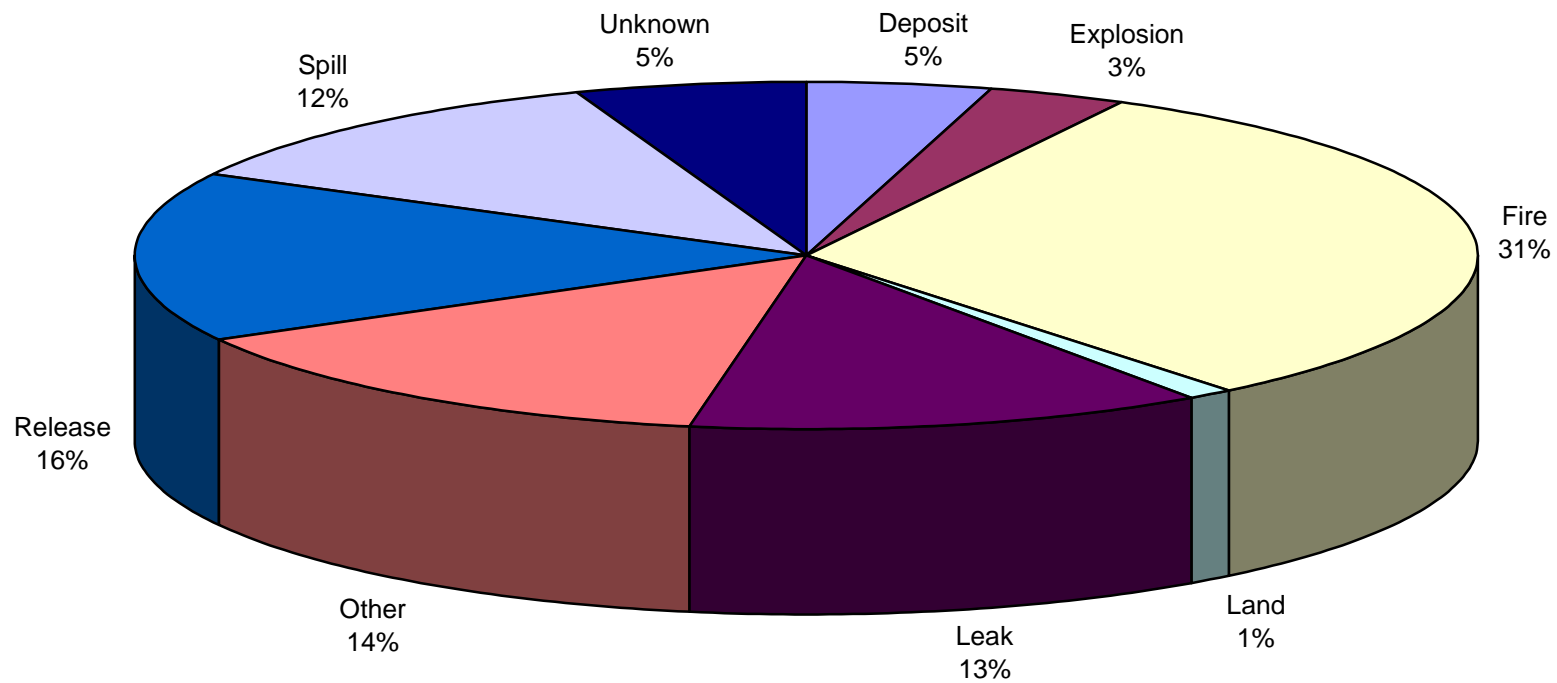


Figure 11: Chemical incident type for chemical incidents reported in England and Wales between 1st January and 30th June 2007 (n=443).