

# CHEMICAL HAZARDS AND POISONS DIVISION CHEMICAL SURVEILLANCE REPORT 1<sup>st</sup> January – 31<sup>st</sup> December 2008



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## Summary

The Division is continually striving to improve the data capture and utility of the on-line national Chemical Incident Surveillance System (CISS) through an ongoing programme of review, revision of the system and training of responders. The information extracted from CISS (refer to Appendix 1 for description of this database) together with data from other surveillance systems (Local and Regional Services (LaRS) surveillance system (IRIS), the South West Environmental Surveillance System (SWESS) and National Chemical Emergency Centre (NCEC)) is used to inform HPA planning and the development of interventions. The information contained in this report is a summary of the analyses of chemical incidents reported for the period 1 January – 31 December 2008. The key findings for the 12 month period of 2008 include:

- **An estimated 187,000 people lived within 250km of reported uncontained chemical incidents in England and Wales including an estimated 48,000 children (0-19 years).**
- **949 chemical incidents were managed and recorded for the reporting period.**
- **There were eight fatalities resulting from seven separate acute chemical incidents reported in this period. Three quarters (6) of the deaths were due to carbon monoxide (CO) poisoning. 443 reported acute incidents resulted in an estimated 2900 - 19220 people being exposed and in a reported 248 incidents an estimated 420 - 2750 people were symptomatic. During one further incident in excess of 1000 people were estimated to have been exposed.**
- **22% (n=213) acute chemical incidents resulted in evacuation of nearby population.**
- **The chemical group most frequently identified was products of combustion (35%, n=326) with the majority being designated as fires. This is followed by “other inorganic” chemicals (14%, n=126) and “other organic” chemicals (12%, n=118).**

- For the reporting period, chemical incidents were most frequently reported in London (28%, n=279), followed by the South East (13%, n=122) and then by the East Midlands (11%, n=104).
- The most common sources of reports (notifying organisation) for chemical incidents, reported in Section 3.8, were Health Protection Units (25%, n=234) followed by National Poisons Information Service (21%, n=197) and the Fire Services (13%, n=124).

## 1. Introduction



The Division manages an on-line chemical incident surveillance system (CISS) for England and Wales. This report provides a summary of the characteristics and distribution of chemical incidents recorded in England and Wales for the period 1<sup>st</sup> January – 31<sup>st</sup> December 2008.

## 2. Method

The method used to carry out all the collation, analyses and interpretation of the surveillance data has been described in the previous surveillance reports<sup>1</sup>. Data are primarily obtained from the on-line Chemical Hazards and Poisons Division (CHaPD) incident management system supplemented by information from the Local and Regional Services (LaRS) surveillance system (IRIS), the South West Environmental Surveillance System (SWESS) and National Chemical Emergency Centre (NCEC), and is described in more detail in Appendix 1.

### Box 1: Definition of chemical incident

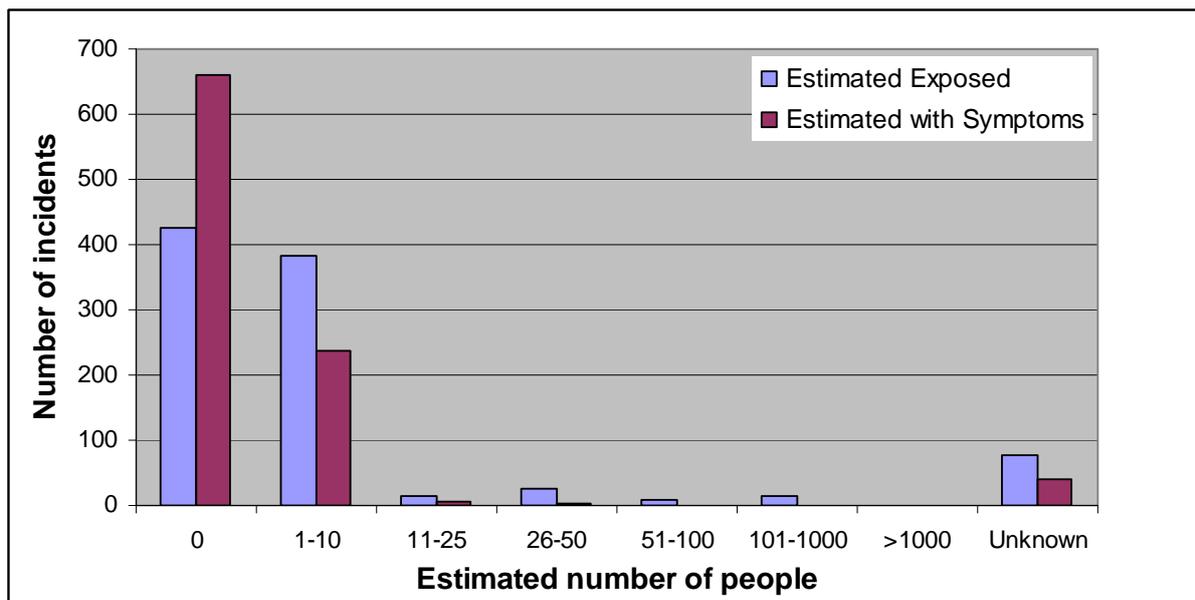
All incidents representing “*an acute event in which there is, or could be, exposure of the public to chemical substances which cause, or have the potential to cause ill health*” meet the CHaPD definition of a chemical incident. Chemical incidents also include all events with an off-site impact as well as on-site incidents where members of the public (hospital staff and emergency services personnel should be regarded as members of the public) are affected.

## 3. Results

After screening for duplicates, exercises, events outside the geographical region of England and Wales and those not meeting the CHaPD definition of a chemical incident (see Box 1), 949 chemical incidents were recorded for the period 1 January through to 31 December 2008 in England and Wales. A summary of the characteristics and distribution of the chemical incidents is outlined below.

<sup>1</sup> [http://www.hpa.org.uk/web/HPAwebFile/HPAweb\\_C/1194947314743](http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1194947314743)

### 3.1. Estimated exposure count at time of incident



**Figure 1:** Number of people estimated exposed to chemical incidents and those exhibiting symptoms for 2008

Between 2900 and 19220 people were estimated to have been exposed with 420 - 2750 reporting symptoms. The exposure numbers exclude more than 1000 people who were exposed in an event in which water supply was contaminated with metaldehyde, to avoid providing a distorted impression (of exposure numbers). Twenty-two per cent (n=213) of chemical incidents resulted in evacuation of nearby populations during 2008 which is similar to that for previous years. There were 8 fatalities as a result of chemical incidents, 6 of which were due to carbon monoxide poisoning.

### 3.2. Nearby populations

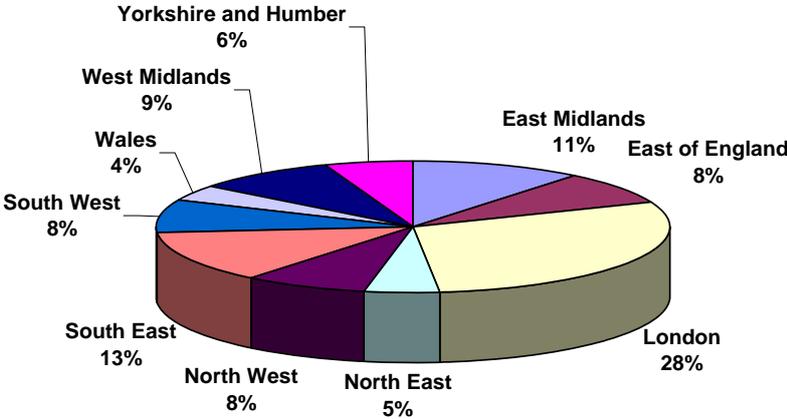
There were 340 uncontained chemical incidents; however, sufficient information was recorded in the logs to enable the postcode to be determined for 71% of such events. It is estimated that over 187,000 people lived within 250 m of uncontained incidents in 2008 of which approximately 48,000 are children under the age of 19 years. Therefore every one in four individuals potentially exposed during a chemical incident is a child.

### 3.3. Regional Distribution of Chemical Incidents

Incidents are reported most frequently in London (28%) followed by the South East (13%) and then East Midlands (11%). The lowest numbers (of incidents) were recorded in Wales and the North East (refer to Table 1). Figure 2 shows the regional distribution of the chemical incidents for 2008 and Figure 3 illustrates the regions in England and Wales. Although there have been a number of ongoing issues with the CISS database, the ascertainment of the geographical location field has been maintained at 100% for 2008.

**Table 1:** Regional distribution of chemical incidents and rate per 1,000,000 population (2008)

Geographical Region	Total number of incidents	Rate per 1,000,000 population
North East	44	17
North West	74	11
Yorkshire & The Humber	53	11
East Midlands	104	25
West Midlands	85	16
East of England	76	14
London	279	39
South East	122	15
South West	75	15
Wales	37	13



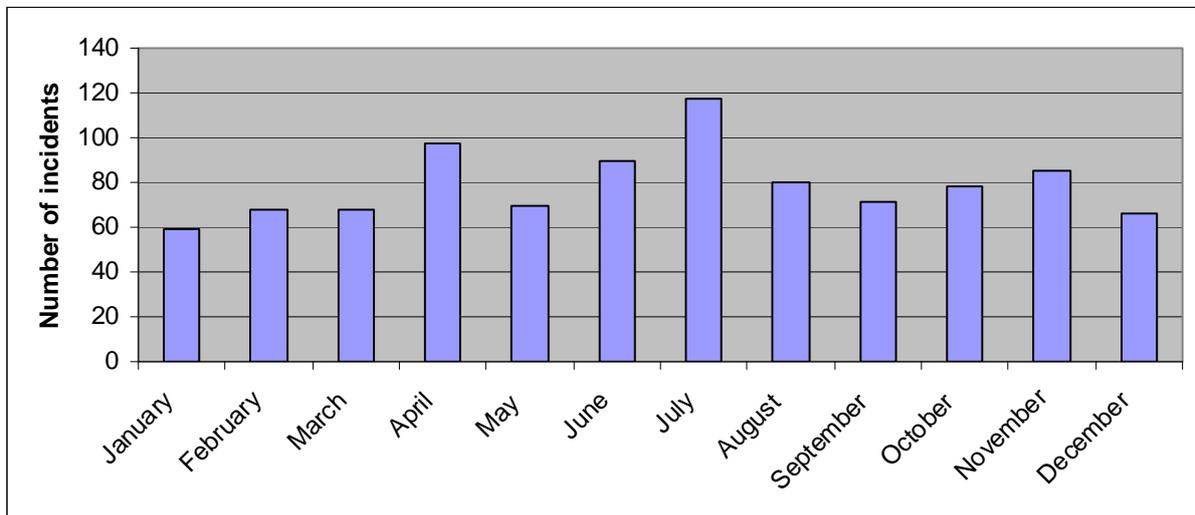
**Figure 2:** Regional distribution of chemical incidents in 2008



**Figure 3:** Map illustrating regions in England and Wales with responsible CHaPD Units superimposed

### 3.4. Temporal Trend

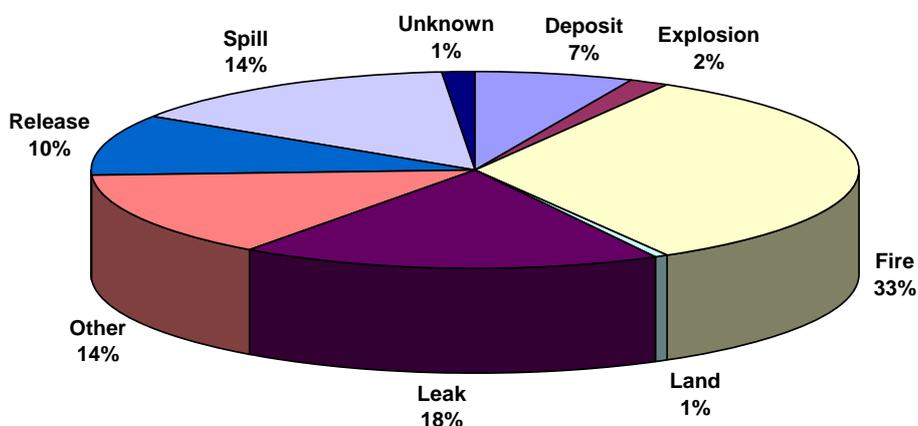
Figure 4 shows that there is no clear trend for the monthly distribution of chemical incidents reported in 2008. The most number of incidents were reported for the month of July which was similar to the status in 2007.



**Figure 4:** Monthly distribution of chemical incidents in 2008

### 3.5. Type of chemical incident

Figure 5 shows that fires (33%, n=319) were the most common type of incident resulting in the release of chemical(s), classed as products of combustion. This is followed by leaks (18%, n=169) and spills (14%, n=136). One in six fires involved cylinders; however, the procedure for the management of this type of incident is well documented and known by all responders. Approximately 14% of fires involved the combined release or potential release of asbestos. Data capture in this field continues to improve, rising from 96% in 2007 to 99% in 2008.



**Figure 5:** Types of chemical incident in England and Wales in 2008

### 3.6. Chemicals involved



The various types of chemicals involved in incidents during the reporting period are shown in Figure 6. Although recording of chemicals involved in chemical incidents has improved, rising from 82% in 2005 to 88% in 2006 and then 89% in 2007, the number of incidents in which this parameter is not known remains high at 8%. The chemical group most frequently reported during the period was products of combustion (35%, n=326) followed by “other inorganics” (14%, n=126), “other organics” (12%, n=118) and metals (6%, n=57). Mercury spills featured in approximately three quarters (n=43) of incidents involving metals. The majority of the events involving mercury took place in residential settings (72%, n=31) and therefore the guidance which was published by the Division regarding mercury spill clean-up<sup>2</sup> is regularly referenced. In addition,

<sup>2</sup> [http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb\\_C/1195733821650?p=1158313435037](http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1195733821650?p=1158313435037)

due to the reporting of more incidents involving the release of mercury from compact fluorescent lamps (CFL), more specific information has been produced<sup>3</sup>.

Despite the efforts of the Agency to raise public awareness of carbon monoxide poisoning, it has been found that the number of incidents involving carbon monoxide leaks has risen from 1% in 2006 to 3% in 2007 to 5% in 2008. This highlights the need for more efforts to be dedicated to the development of policies/interventions to address this issue.

It was also noted that 26 events involved the accidental spill/handling/use/storage of chemicals at swimming pools. Although this number only accounts for 3% of all chemical incidents recorded, it indicates that 3 in 4 incidents involving the release of halogens occur in swimming pool settings.

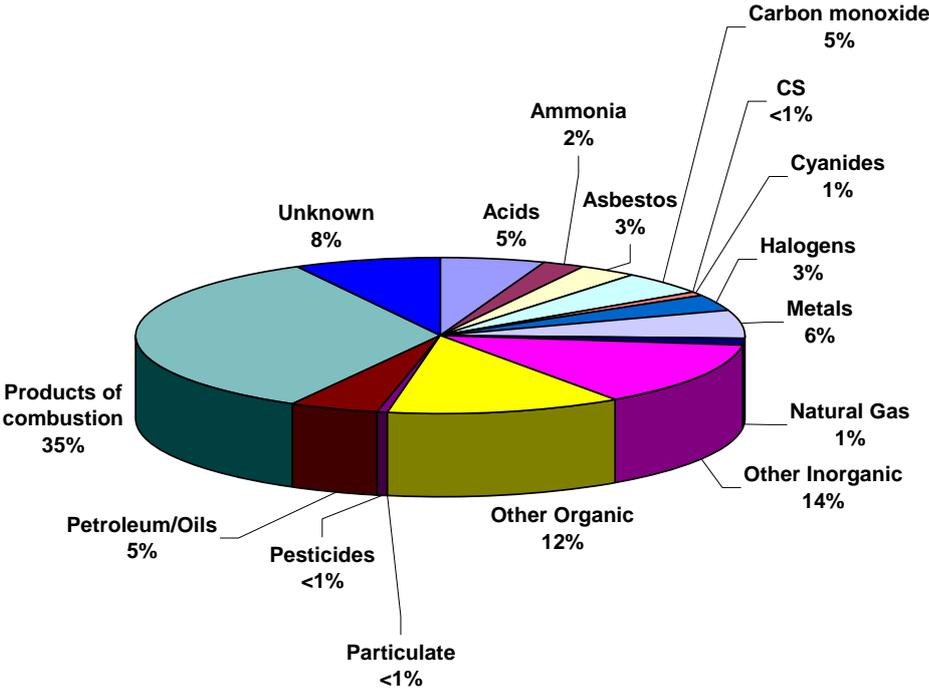


Figure 6: Chemicals involved in chemical incidents in 2008

<sup>3</sup> [http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb\\_C/1207293983993?p=1158313435037](http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1207293983993?p=1158313435037)

### 3.7. Chemical incident location

Chemical incidents most often occur in industrial settings (27%, n=258) followed by residential (25%, n=240) and commercial properties (14%, n=133). Similar to the findings in previous years, approximately 20% of events in residential locations are fires. Thirteen per cent of incidents in residential settings involved the leak of carbon monoxide and approximately 12% related to the release of mercury. Although <1% of chemical incidents occurred at COMAH sites, demonstrating the effectiveness of process control at these sites, it was noted that 2 of the 4 incidents recorded for 2008 occurred at the same site within the period of 1 month. Hence a recommendation as a result of this review will be for the relevant CHaPD Unit, in collaboration with other agencies/organisations, to undertake further investigations into the cause(s) of the incidents.

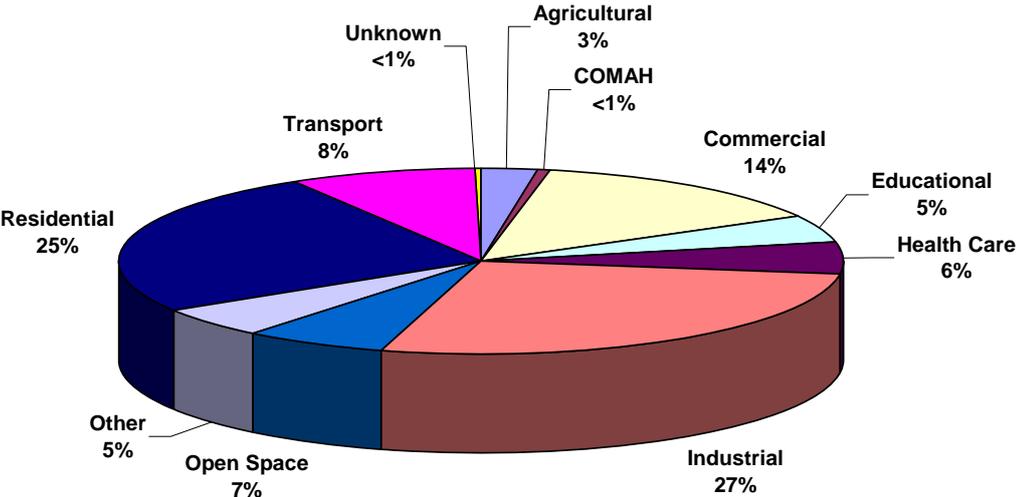
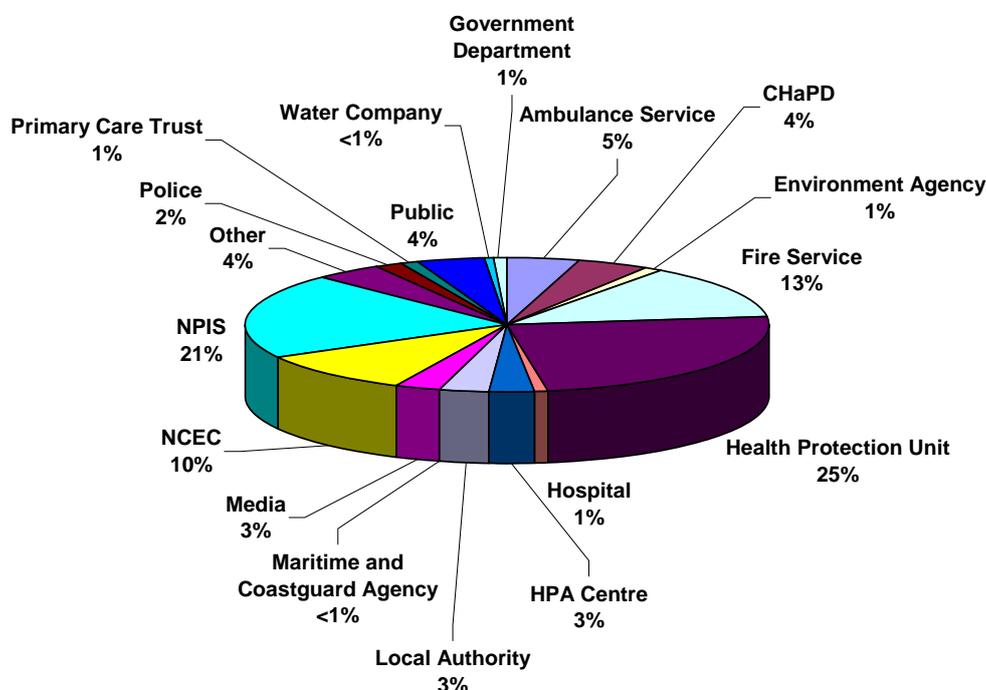


Figure 7: Location type of chemical incidents in 2008

### 3.8 Notifying organisation of chemical Incidents

Figure 8 shows the proportion of chemical incidents by the reporting organisation. Health Protection Units reported 25% (n=234) followed by National Poisons Information Service (21%, n=197) and the Fire Service (13%, n=124). NPIS is contracted to answer all out-of-hours calls to the Division which is reflected in the large number of incidents reported via that route. However, the system is being

refined to ensure that the originating agency is effectively recorded. The completion of this field has improved from 99% in 2007 to 100% in 2008.



Abbreviations:

NPIS	National Poisons Information Service
NCEC	National Chemical Emergency Service

**Figure 8:** Notifying organisation of chemical incidents in 2008

#### 4. Discussion

During 2008, information extracted from the CHaPD system has been used to undertake a number of research projects as well as to identify the development of public health information and protocols for chemical incident management, for instance the mercury spill information<sup>2</sup> and the CFL<sup>3</sup> advice.

The surveillance system is currently undergoing some improvements and a new system will be launched during autumn 2009 which will be hosted by the HPA server. The system has been revised in line with recommendations from the users and will facilitate the generation of reports as and when required.

A Chemical classification Group has been established this year to oversee the classification of chemicals recorded in the database and to classify new ones as they are reported to the system.

Further work on the system will continue after the implementation of the new one and will seek to incorporate Geographical Information System (GIS) capabilities which will assist during the management of chemical incidents.

## **APPENDIX 1: Background to Chemical Incident Surveillance System (CISS)**

A multi-agency environmental public health surveillance system which was established in Wales in 1993 developed into an effective mechanism for identifying chemical hazards with potential public health implications and for informing policy development. A similar system was established in England in the West Midlands by the Chemical Hazard Management and Research Centre at the University of Birmingham. This surveillance system also supported Health Service emergency planning and response through the real time notification of serious incidents.

Given the success of the Welsh and West Midlands surveillance systems, the National Focus for Chemical Incidents based at the University of Wales Institute in Cardiff developed a national surveillance programme for England and Wales. Data were provided by regional chemical incident response units based in Cardiff, London, Newcastle and Birmingham, the Scottish Centre for Infection and Environmental Health (SCIEH), Ambulance Service Association (ASA), the Police (Hazchem scheme), the National Chemical Emergency Centre (NCEC), and the Maritime and Coastguard Agency (MCA).

The Environmental Health and Risk Assessment Unit (EHRA) of the Centre for Radiation, Chemical and Environmental Hazards (CRCE) became responsible for the national surveillance of chemical incidents programme in 2005 and implemented an on-line national Chemical Incident Surveillance System (CISS). CISS is closely linked to the Scottish Environmental Incident Surveillance System (SEISS) systems and they are the only national population based surveillance systems in the world. CISS has a number of fields to capture details such as regional location of incidents, type of incidents, numbers of people exposed during an incident, source (notifying organisation) of an incident *etc.*

The information recorded in CISS is used in conjunction with information from HPA Local and Regional Services (LaRS) surveillance system (IRIS), HPA South West Environmental Surveillance System (SWESS) and National Chemical Emergency Centre (NCEC) to inform HPA planning and the development of interventions.