Notes relating to the compilation of CO-Gas Safety statistics and graphic representations

The statistics represented in this press pack have been prepared using the CO-Gas Safety database of information relating to unintentional carbon monoxide poisoning cases.

The database records both fatal and non-fatal incidents, but the statistics published here include only those that resulted in a life lost. Other exposures that caused injury or potential risk to health are not included. Many of the incidents that resulted in the included fatalities will have also injured or affected other individuals.

The database itself covers all information that CO-Gas Safety has been able to compile for incidents that took place from 01/09/1995 to the present day. The statistics shown in this press pack were gathered from the database on 31/08/2018 and therefore do not include any data that was added to, or updated in, the database after that date. For this reason, there may be incidents that took place before 31/08/2018 (but recorded by CO-Gas Safety after that date) that are not included in this set of statistics. This often includes cases where the necessary inquest has not yet been concluded.

As we are continually working on the information that we hold on the database (to ensure that press reports are officially verified by bodies such as Coroners, the Health & Safety Executive, Police & Fire Services etc) there will be differences between the figures published by CO-Gas Safety here and in previous CO-Gas Safety releases. This would be particularly noticeable in those statistics that quote fatality figures by specific annual intervals.

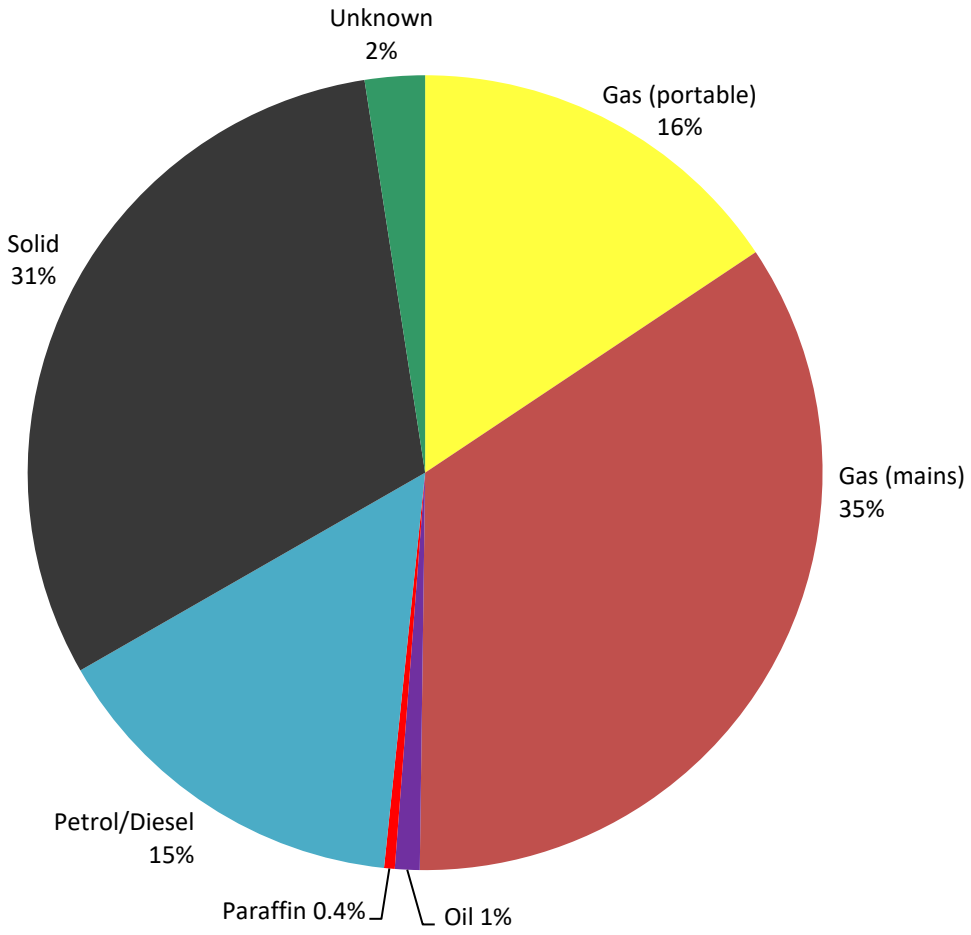
As percentage figures are quoted as whole numbers (and to one decimal place for any results less than 1%), the sum of all categories quoted may not give a total of exactly 100%.

For many of the systems and appliances involved in unintentional carbon monoxide poisoning incidents, the cause of the leak of carbon monoxide that results in a potentially fatal situation may be a fault or blockage in the flue system, rather than the appliance itself. However, it is the appliance requiring the flue that is used to produce our statistics. In some cases it may be that there was no fault with the actual appliance but that it was used inappropriately, such as without adequate ventilation (if vents were covered over or if an outdoor generator, BBQ or patio heater was used indoors).

Most of the charts included in this press pack show a category of 'unknown'. For these cases the field of data relevant to that particular chart may be inconclusively definable for a number of reasons – the information may not have been deemed relevant to the circumstances of the death and therefore not included in the inquest proceedings, or the wording used in a press report may have had multiple possible interpretations. For some incidents, Coroner's offices no longer held full paper records, due to fire or flood, and held only sparse details on computer archives. If CO-Gas Safety could not determine the information with certainty, then a response of 'unknown' was recorded for statistical purposes, and notes of our assumptions and/or suspicions will have been made anecdotally within the database notes.

Where necessary, notes have been given below a chart to help clarify the categories used in their production. These are sometimes difficult to define and incidents can often fall into more than one dataset. In such circumstances a judgement must be made by the compiler of the statistics. Examples are as follows: in the *appliance type* chart, cases resulting from misuse of portable outdoor patio heaters have been included in the 'portable heater (outdoor)' category, but could just as easily have been assigned to the 'camping equipment' category instead; in the *place* chart, a case of a tradesman being poisoned while working on an unfinished new-build home was categorised under 'workplace' rather than 'house'; and a victim discovered in a shed behind a restaurant was categorised under 'commercial premises' rather than 'shed or similar', as it was felt that it was more important to reflect the ownership of the locations than their construction. This may be an aspect of our research that we show with further detail and clarity in future publications.

FUEL TYPE relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2018

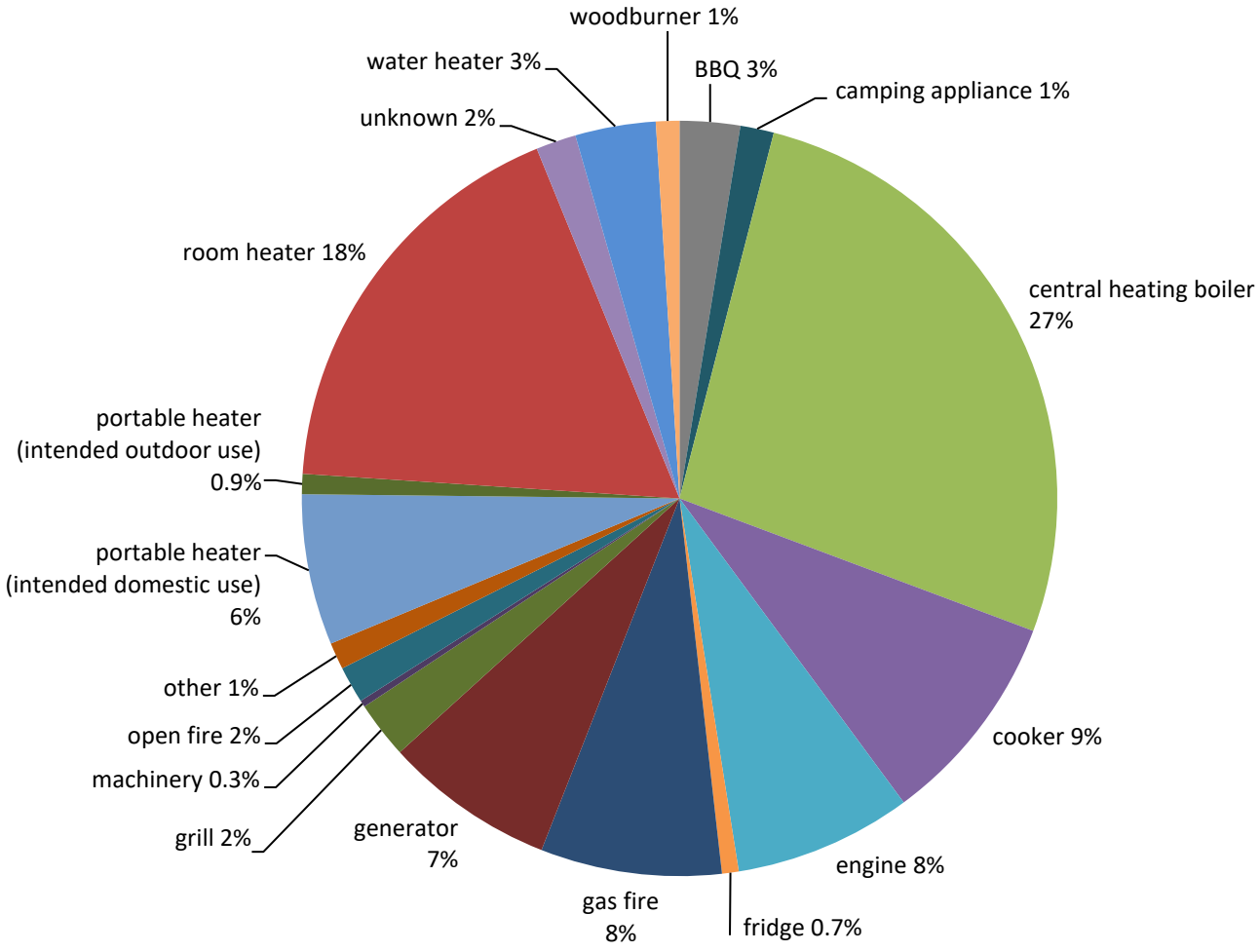


CO-Gas Safety comment

This chart shows that gas is responsible for the greatest percentage of the deaths included in our data, but our data so far also suggests that, per user, gas causes *less* deaths from carbon monoxide than solid fuel (since the number of users of solid fuel across the UK is far less than that of gas users).

In other words, considering the relatively small number of solid fuel users, there is a high incidence of deaths from solid fuel compared to that of gas.

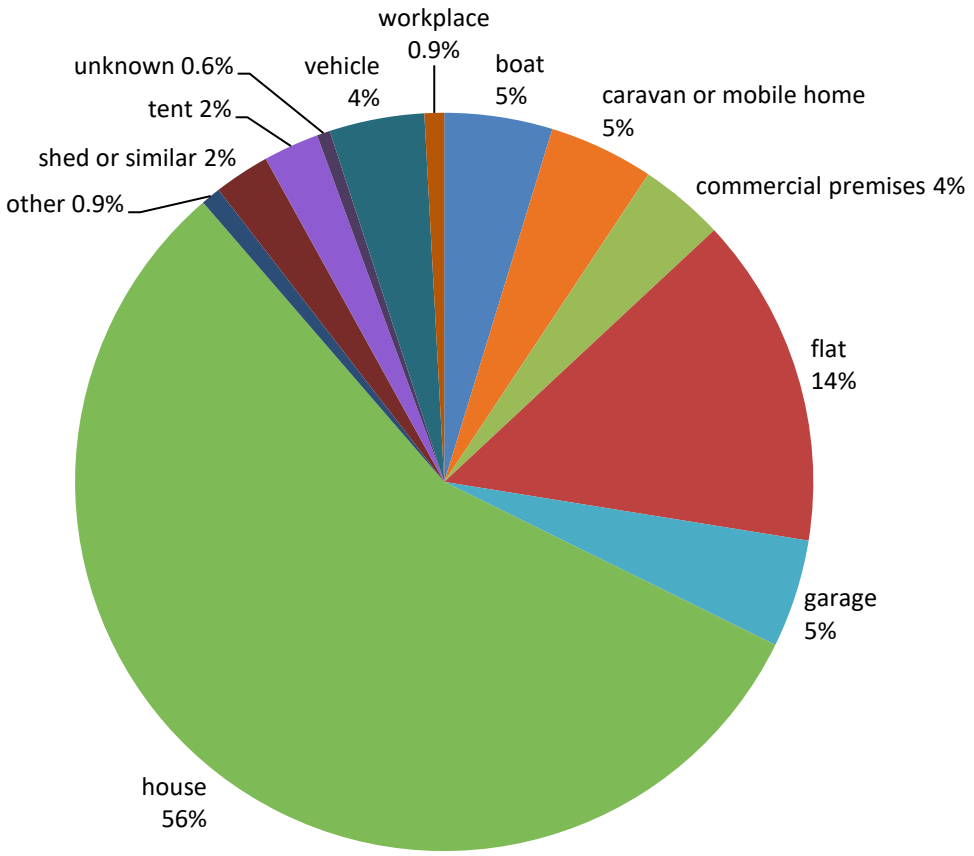
APPLIANCE TYPE relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2018



'camping appliance' includes items other than BBQ's, such as gas lamps and gas or paraffin stoves.
'central heating boiler' includes mains gas, oil and solid fuel systems. Back boiler systems are included in this category.
'cooker' includes hobs, range cookers and permanent stoves (not portable camping stoves).
'engine' is of any type, including from a car, lorry (or other motor vehicle), aeroplane or boat.
'fridge' is of a portable type, powered by Liquid Petroleum Gas cylinder.
'generator' is a portable machine.
'machinery' indicates industrial or commercial machinery, such as a disc cutter.
'woodburner' indicates a permanently installed domestic appliance intended for indoor use. Multi-fuel burners are included in this category.

CO-Gas Safety comment
It is interesting that the largest proportion of deaths by one appliance is by a central heating boiler.

PLACE OF INCIDENT relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2018

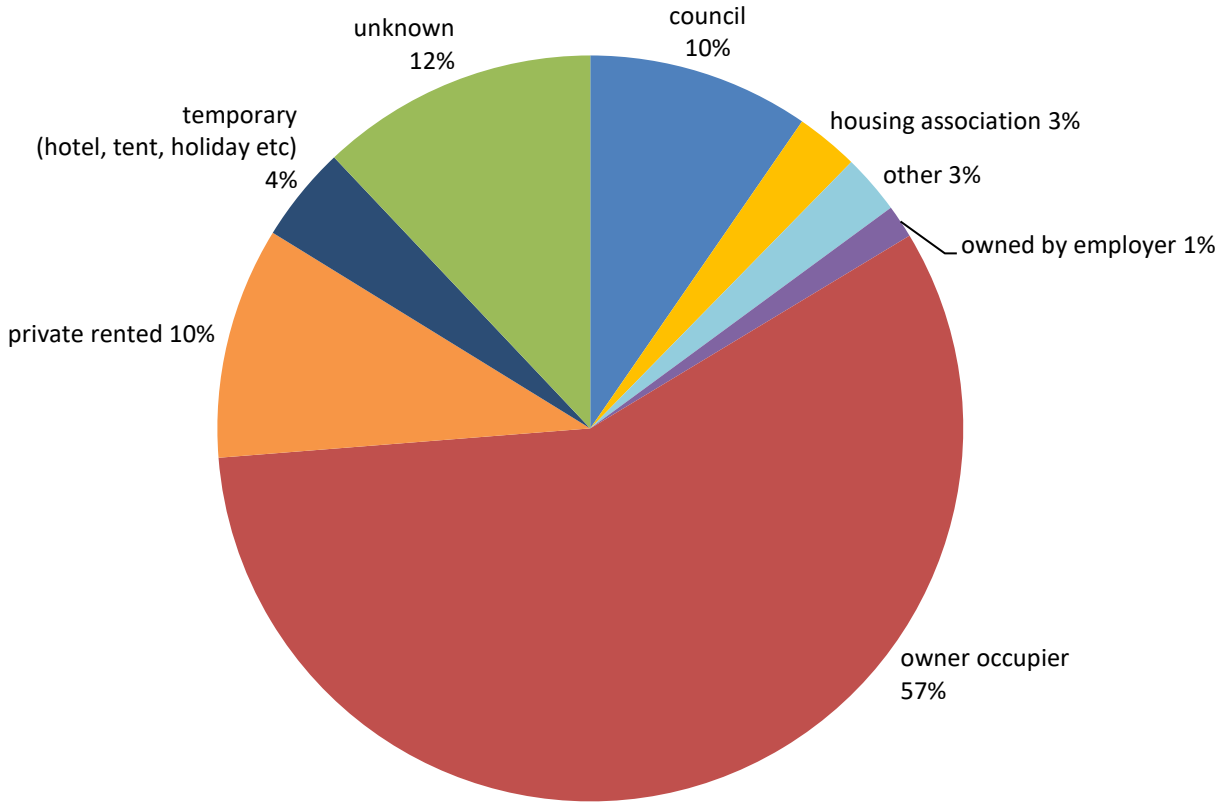


'commercial premises' includes shops, public houses, hotels, restaurants & guest houses.
'flat' includes bedsits, and both purpose-built flats and those converted from larger dwellings.
'house' includes bungalows, detached, semi-detached and terraced houses.
'other' includes a greenhouse, care homes, public halls and workshops.
'shed or similar' includes metal containers, wood cabins, outhouses and portacabins.
'vehicle' includes all types (other than boat) such as car, lorry, camper van and aeroplane.
'workplace' includes building sites, offices and other work sites.

CO-Gas Safety comment
It is easy to see that people at home are most at risk from carbon monoxide poisoning.
For an example please see http://www.mirror.co.uk/news/real-life-stories/thought-early-dementia-three-years-5930721 *Daily Mirror*, 22 June 2015 by Angela Cooke.
It is interesting to note, however, that most publicity seems to be given to those deaths that occur on holiday or in tents etc.

Dr Ben Croxford's research at UCL (University College London) in 2006 found:
• 23% of homes had one or more defective gas appliance;
• 8% of homes were judged to be at risk of dangerous levels of CO;
• 45% of homes had received no information on the dangers of CO; and
• A higher prevalence of problem appliances was found in the homes of vulnerable people, such as the young, the old, and those in receipt of benefits. (Taken from HSE press release 2006).

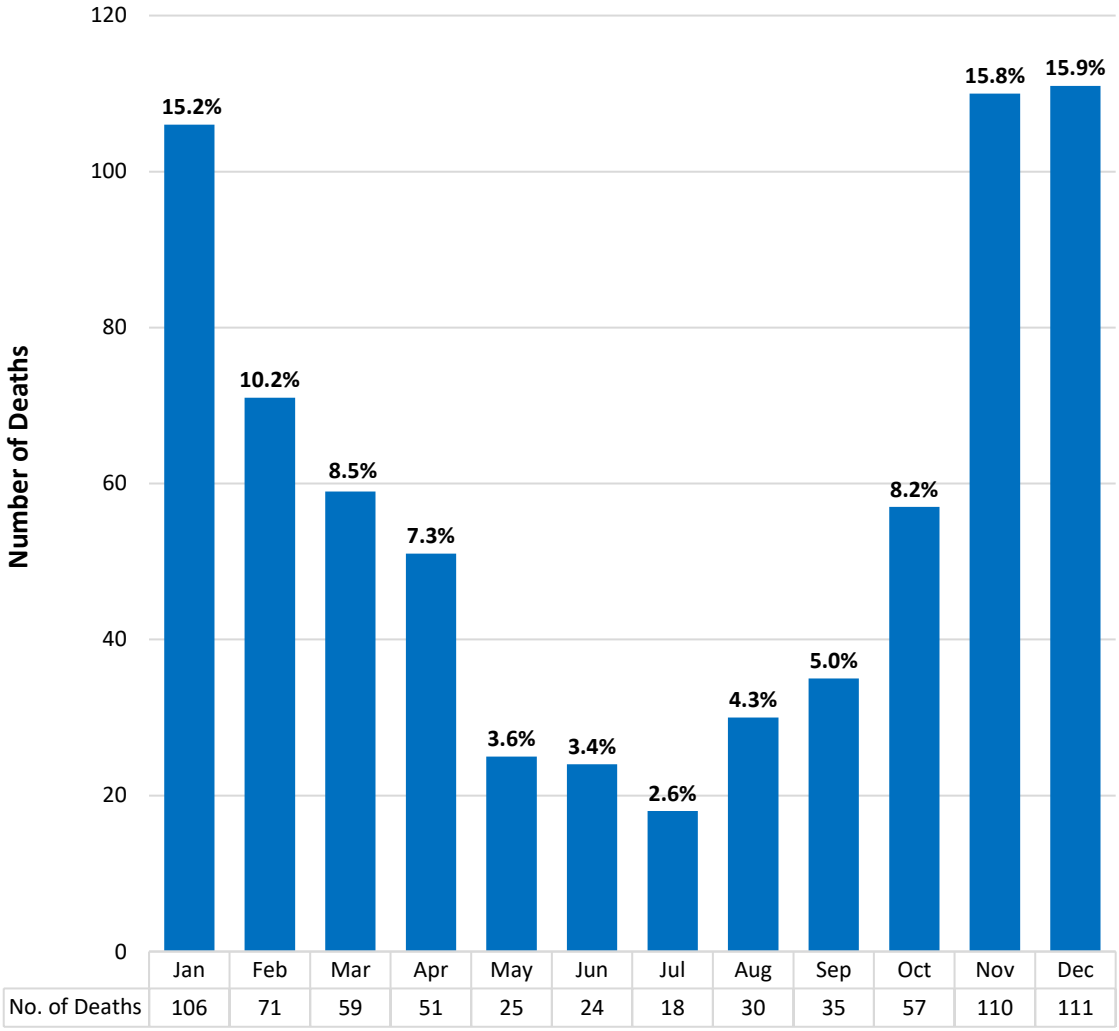
TENURE TYPE relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2018



According to the Communities & Local Government Dwelling Stock Estimates England 2017:
There were 23.9 million dwellings in England at 31 March 2017, an increase of 217,000 dwellings (0.92%) on the same point the previous year.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/710382/Dwelling_Stock_Estimates_2017_England.pdf & (Note this is calculated every year).
Of these, 15.1 million dwellings were owner occupied dwellings, 4.8 million private rented dwellings and 4.0 million social and affordable rented dwellings (Private Registered Providers 2.4 million, plus Local Authority 1.6 million)
https://www.hpmmag.com/news/half-uk-households-say-not-need-carbon-monoxide-detector
More than a third (36%) of households do not have a CO alarm and over half (52%) of those who do not have a CO alarm say they are aware of what one is but don't feel a need for one at home.

CO-Gas Safety comment
Bearing in mind the figures above, the incidence of deaths in owner occupied property looks lower than expected (57% deaths as opposed to expected 63%), although there is quite a high incidence of unknown tenure (12%) which could easily account for this. The incidence of deaths in council owned property looks relatively high (10% deaths – would expect 6.7%) while the incidence of deaths in housing associations (3% deaths – would expect 10%) looks low compared to the percentage of properties owned by housing associations. It would be really helpful to have even more co-operation from Coroners to record the tenure which, of course, the government could require.

MONTH of death relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2018

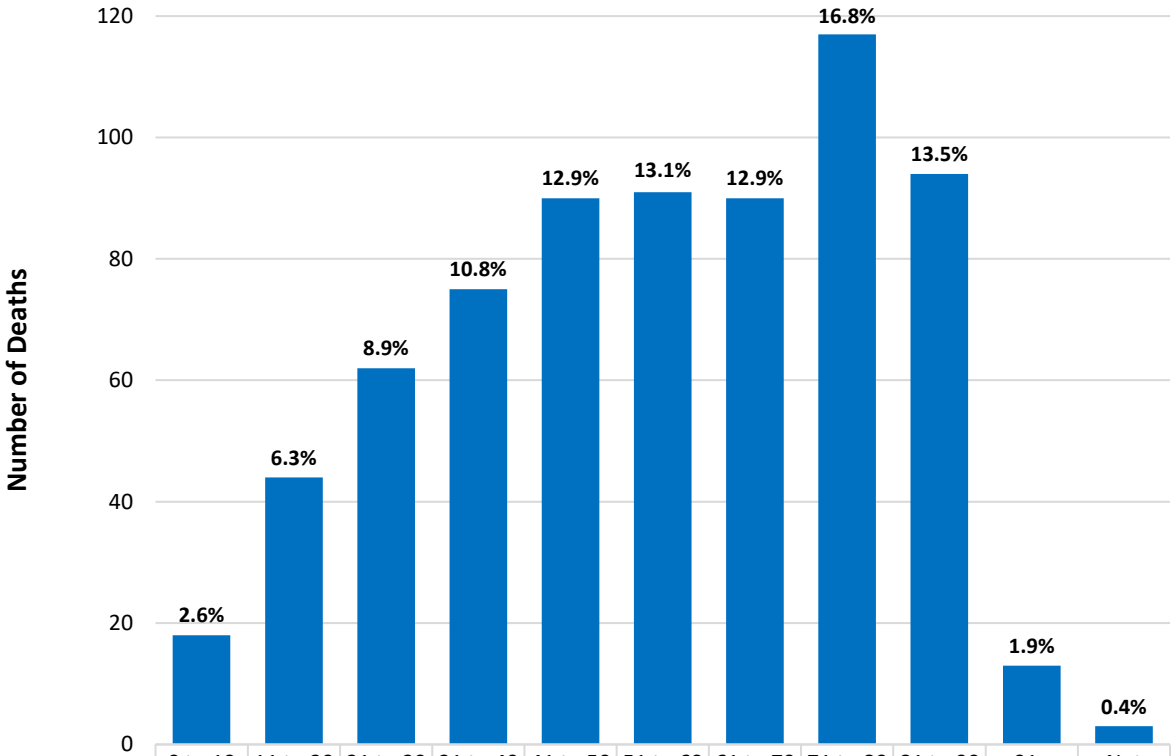


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
No. of Deaths	106	71	59	51	25	24	18	30	35	57	110	111

CO-Gas Safety comment

It is unsurprising that the colder months of November, December and January contain the highest number of deaths.

AGE OF VICTIMS relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2018



Age of Victims	0 to 10 years	11 to 20 years	21 to 30 years	31 to 40 years	41 to 50 years	51 to 60 years	61 to 70 years	71 to 80 years	81 to 90 years	91+ years	Not known
No. of Deaths	18	44	62	75	90	91	90	117	94	13	3

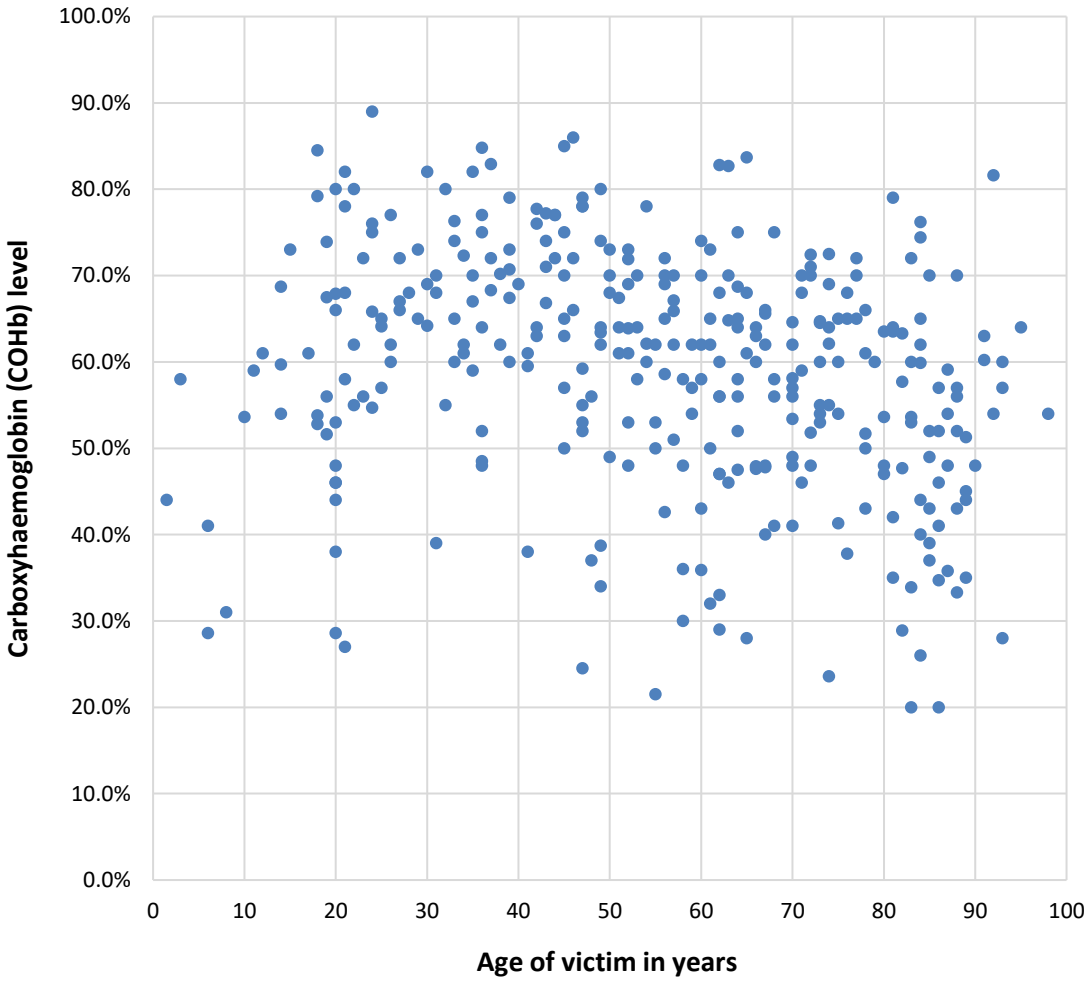
CO-Gas Safety comment

It is interesting to note that those aged 71-80 years make up just over 7% of the population* yet represent around 17% of the total deaths. In our opinion, many more deaths in this age group that may actually be due to CO are probably put down to 'heart attack' or other 'natural causes' (and therefore do not come to our attention and become included in our statistics). This is because there is no automatic test for CO on death, meaning the number of deaths in this age group in particular could be even higher.

**Taken from ONS Table P01 2011 Census: Usual resident population by single year of age and sex, England and Wales.*

The Gas Safety Trust is funding a pilot to develop a protocol to test *all* dead bodies for CO in three coronial areas. This started in early 2016 and has not yet been published.

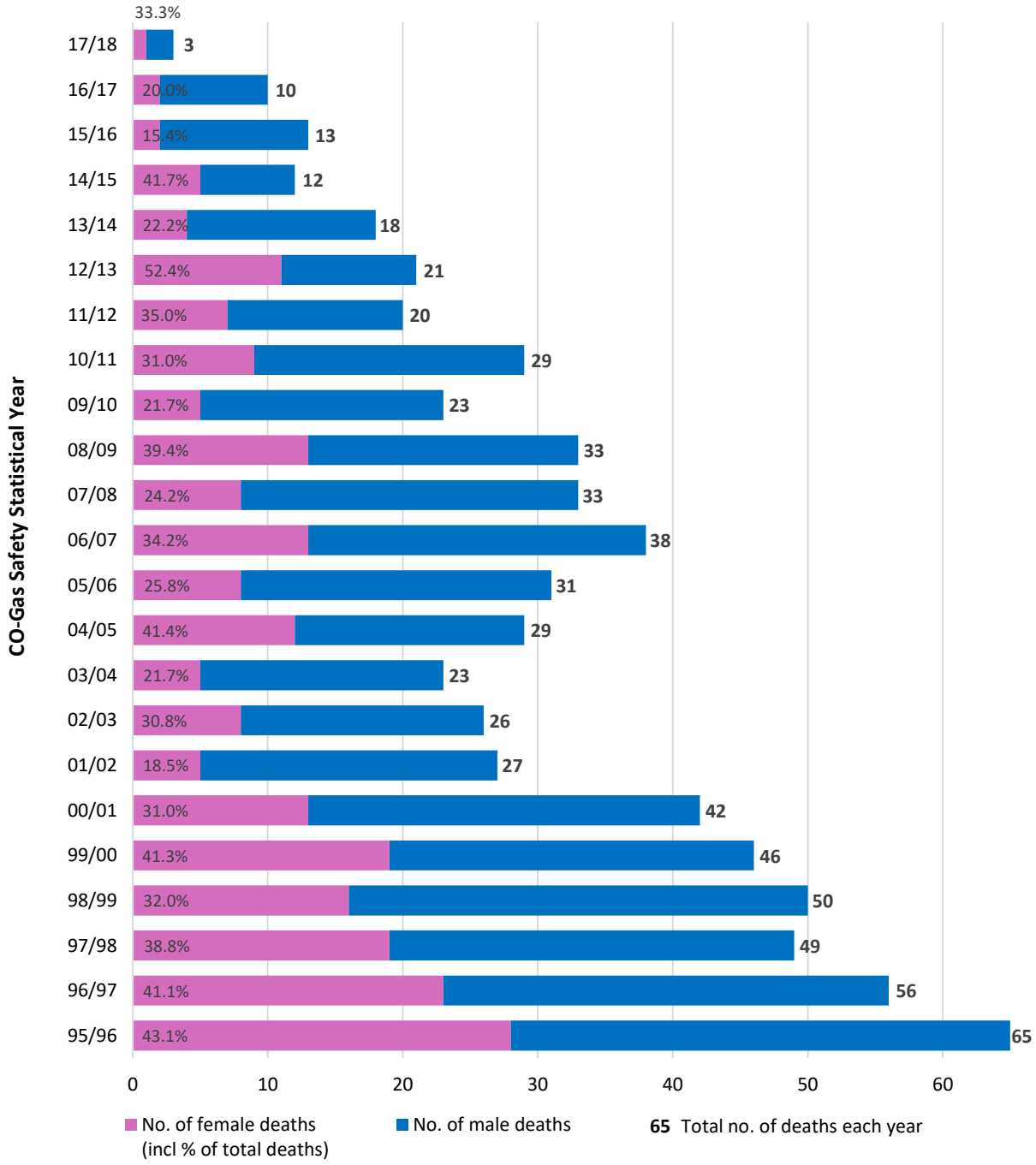
COHb LEVEL OF VICTIMS relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2018



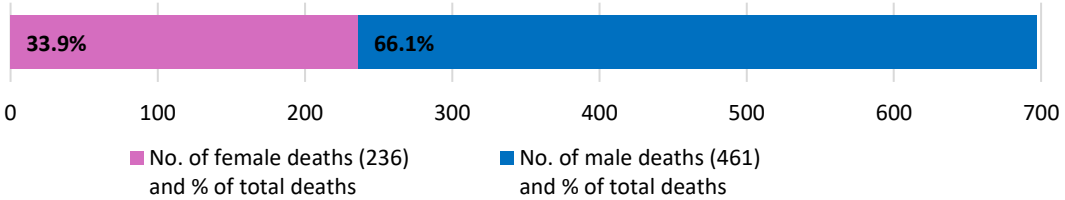
CO-Gas Safety comment

For this analysis we have data available for 338 victims. This represents a huge increase on the recording of COHb levels in our database and may be of interest to the scientific community.

GENDER OF VICTIMS relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2018



Total deaths by gender 01.09.1995 - 31.08.2018



LOCATION OF INCIDENT relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2018

ENGLAND	No. of deaths
Bedfordshire	1
Berkshire	7
Buckinghamshire	7
Cambridgeshire	6
Cheshire	5
Cornwall	20
Cumbria	18
Derbyshire	27
Devon	11
Dorset	7
Durham	9
East Sussex	10
East Riding of Yorkshire	2
Essex	21
Gloucestershire	6
Greater London	60
Greater Manchester	16
Hampshire	7
Herefordshire	2
Hertfordshire	12
Kent	26
Lancashire	18
Leicestershire	8
Lincolnshire	17
Merseyside	7
Norfolk	17
North Yorkshire	15
Northamptonshire	2
Northumberland	5
Nottinghamshire	11
Oxfordshire	12
Shropshire	10
Somerset	13
South Yorkshire	32
Staffordshire	21
Suffolk	5
Surrey	4
Tyne & Wear	11
Warwickshire	7
West Midlands	16
West Sussex	8
West Yorkshire	23
Wiltshire	9
Worcestershire	4
TOTAL	**555**

WALES	No. of deaths
Clwyd	6
Dyfed	23
Gwent	18
Gwynedd	8
Mid Glamorgan	15
South Glamorgan	6
West Glamorgan	13
TOTAL	**89**

SCOTLAND	No. of deaths
Borders	2
Central Scotland	2
Fife	7
Glasgow	3
Grampian	1
Highlands and Western Isles	1
Lanarkshire	4
Lothian	3
Renfrewshire	2
Tayside	3
Unknown Scottish Location	2
TOTAL	**30**

NORTHERN IRELAND	No. of deaths
County Antrim	7
County Armagh	1
County Down	6
County Fermanagh	4
County Londonderry	2
County Tyrone	3
TOTAL	**23**

England	555
Wales	89
Scotland*	30
Northern Ireland	23
TOTAL UK DEATHS	**697**

*Note that Scotland does not have a Coronial system as the other UK countries do, but holds Fatal Accident Inquiries for a much smaller proportion of deaths (less than 100 per annum). It is possible that this contributes to the lower rate of CO deaths recorded in Scotland.