

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, some to a life-changing extent. We can only emphasise that our statistics only give a baseline for the possible devastation that unintentional carbon monoxide poisoning causes to UK citizens of all ages, class, income, ethnicity and location every year – there are undoubtedly fatalities that we are not aware of.

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 31/08/2024 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 31/08/2024 (but were 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 and sometimes this can take several years.

As we are continually working on the information that we hold on our database (to ensure that press reports are officially verified by bodies such as Coroners, the Health & Safety Executive, Police and 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.

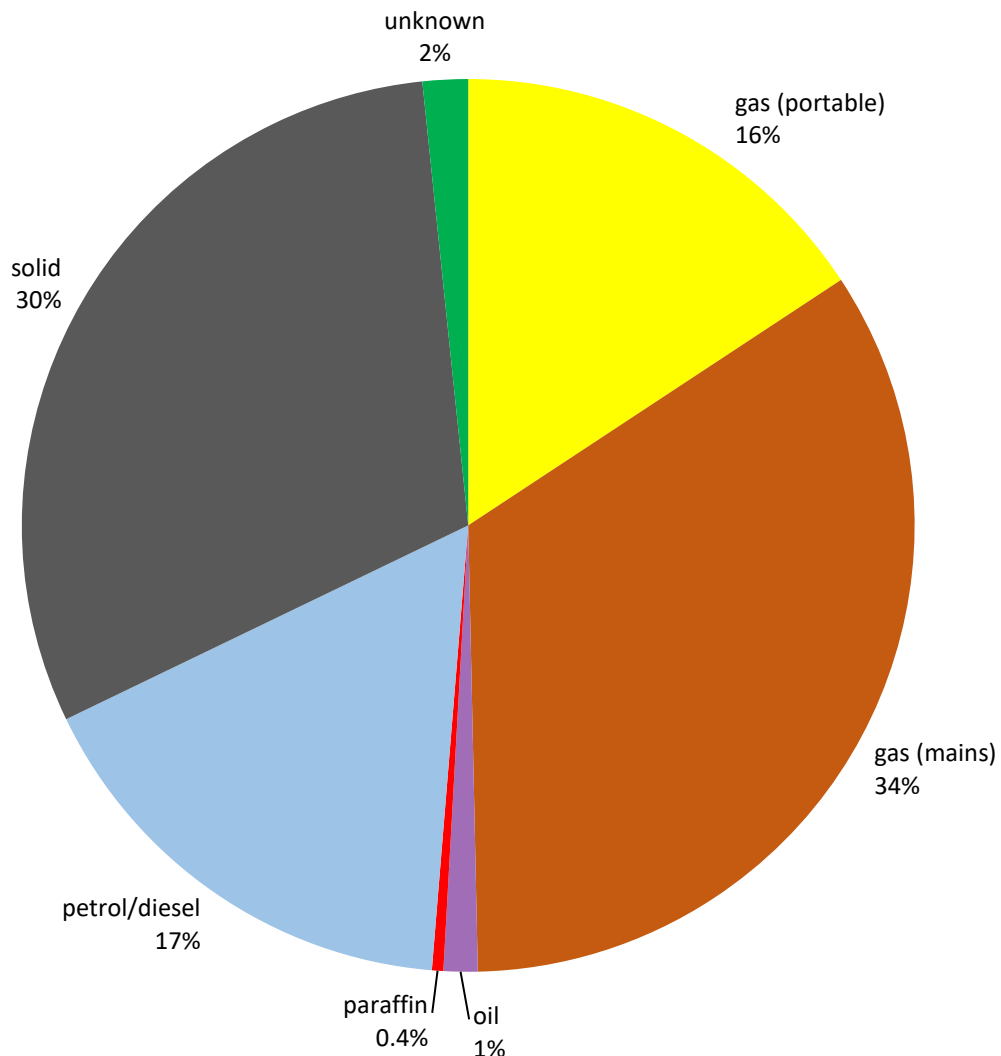
As percentage figures are quoted as whole numbers (and to one decimal place for any results less than 1%), the sum of all categories quoted may not give a total of exactly 100%.

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, for example).

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.

FUEL TYPE relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2024

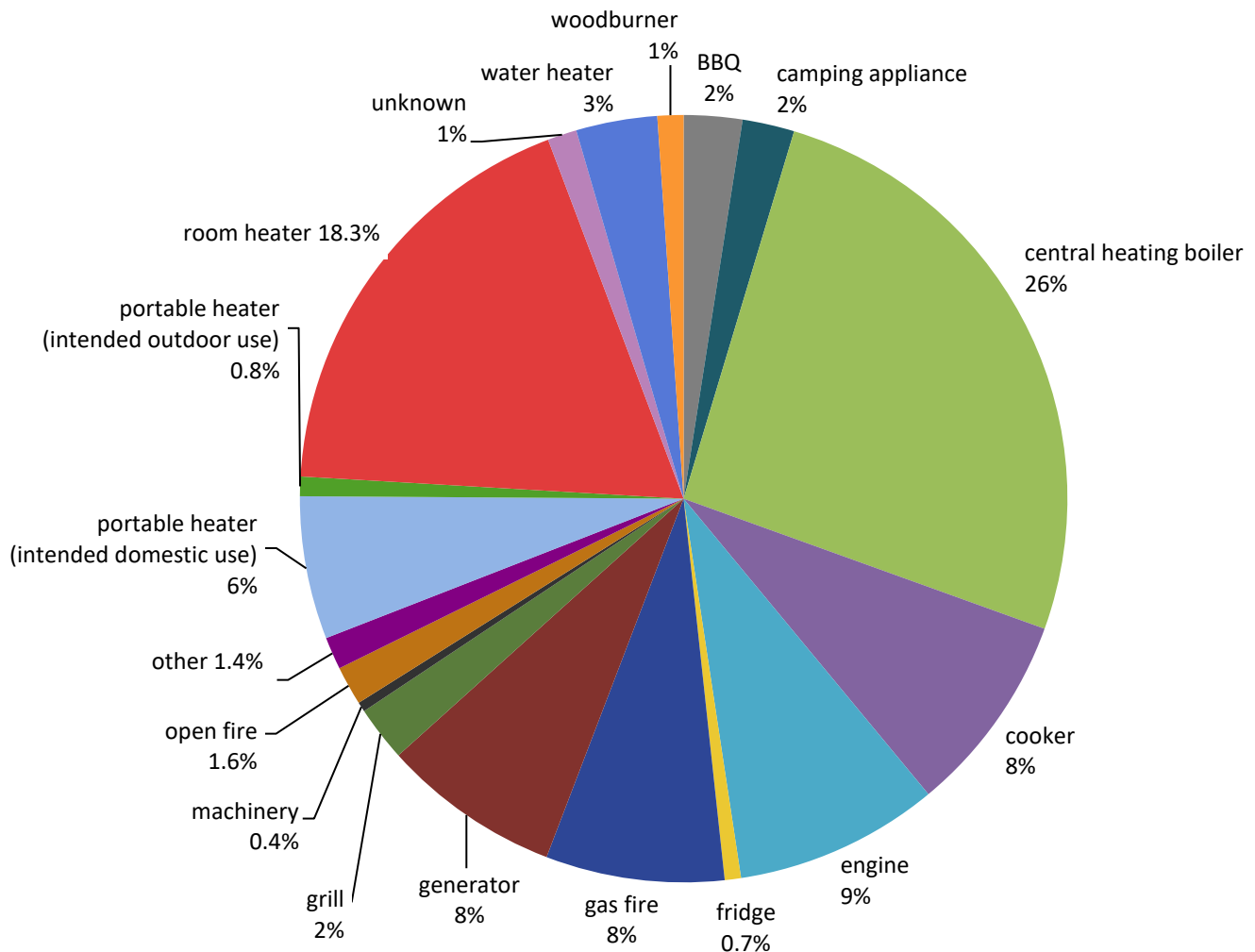


CO-Gas Safety comment

This chart shows that gas (both mains and portable forms) 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 unintentional 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.

It is also worth noting here that unintentional non-fire-related deaths from carbon monoxide that were due to petrol/diesel use accounted for *over half* of the total deaths recorded by CO-Gas Safety in the last 8 years (see summary sheet of statistics on our website for breakdown by year and fuel). This marks a sharp increase in the proportion of deaths from these fuels and causes concern that the public may not give enough consideration to the fact that these are carbon-based fuels that can produce CO.

APPLIANCE TYPE relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2024



'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.

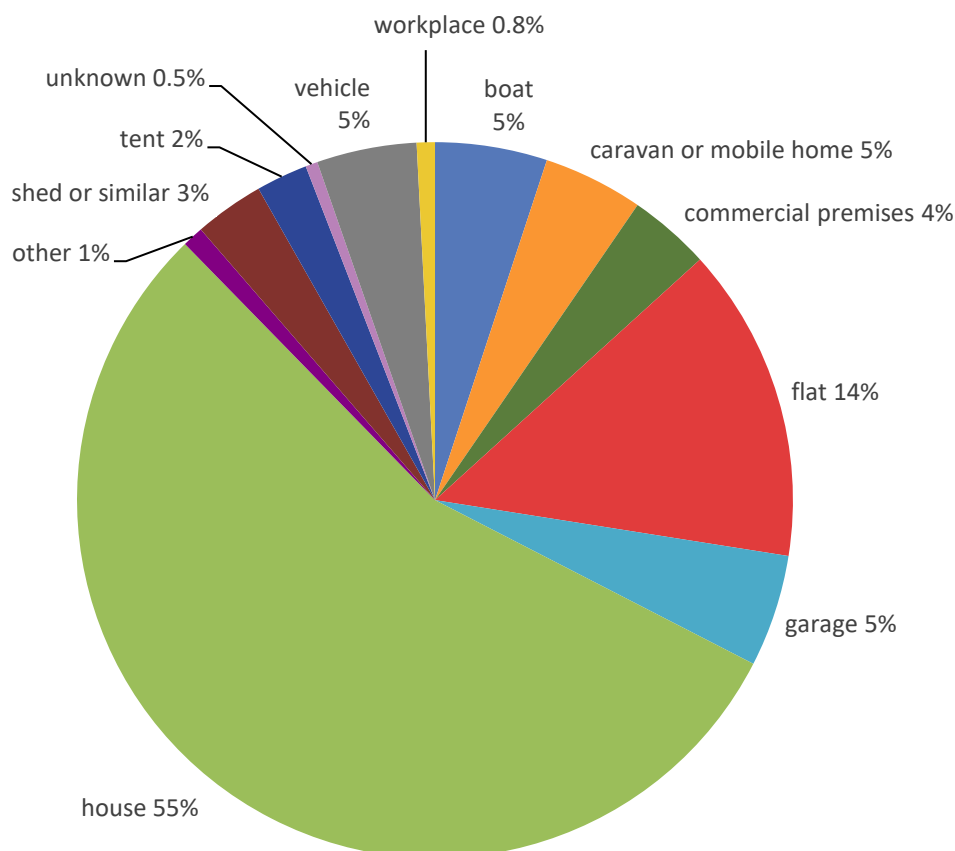
'machinery' indicates industrial or commercial machinery, such as a disc cutter.

'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, but it must be remembered that although people often think of this as the main danger from CO, they actually only account for just over a quarter of all fatalities.

PLACE OF INCIDENT relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2024



'commercial premises' includes shops, public houses, hotels, restaurants and 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 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.

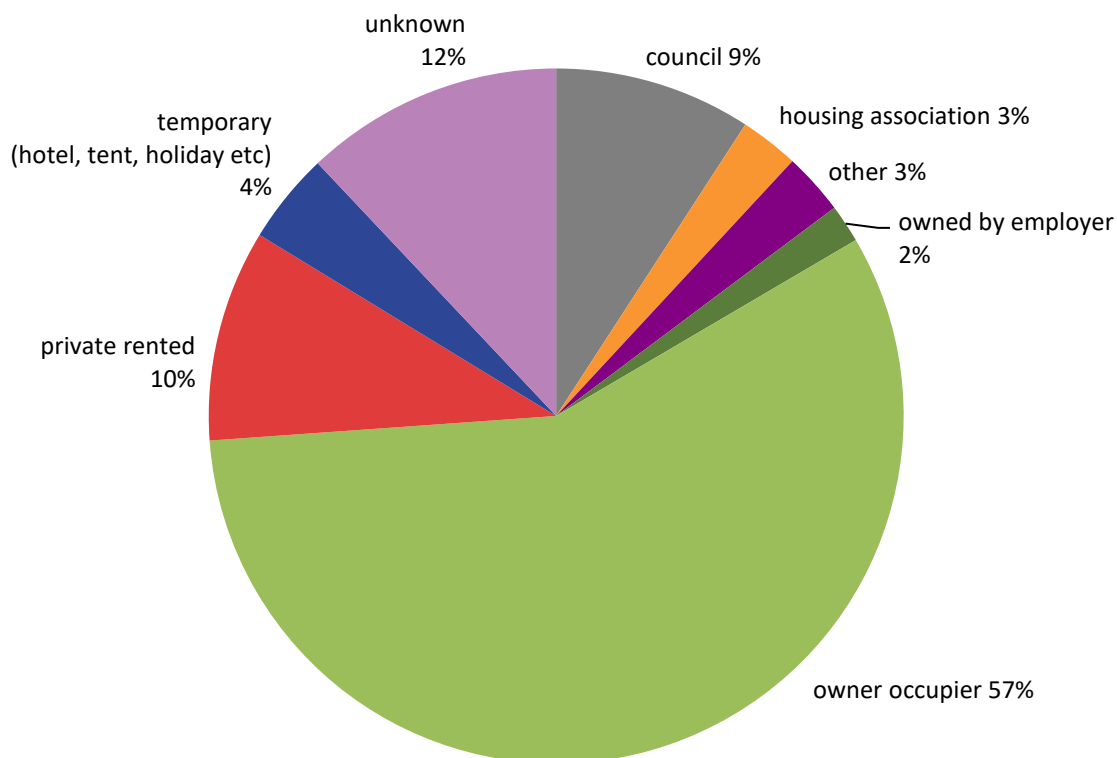
CO-Gas Safety comment

It is easy to see that people at home are most at risk from carbon monoxide poisoning. Despite this, a 2024 YouGov survey of over 6,500 GB adults found that only 45% of 18-24yr olds were certain they had at least one CO alarm in their household. Hopefully, the updated *Smoke and Carbon Monoxide Alarm (Amendment) Regulations 2022* will improve this figure. Since 1st Oct 2022, rented properties in England must have a CO alarm in any room containing a combustion appliance (except gas cookers). Scotland and Northern Ireland requirements vary; seek advice from this APPCOG summary: www.policyconnect.org.uk/news/carbon-monoxide-alarm-regulations-are-changing-are-you-ready

In 2006, Dr Ben Croxford's research at UCL (University College London) 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 31.08.2024

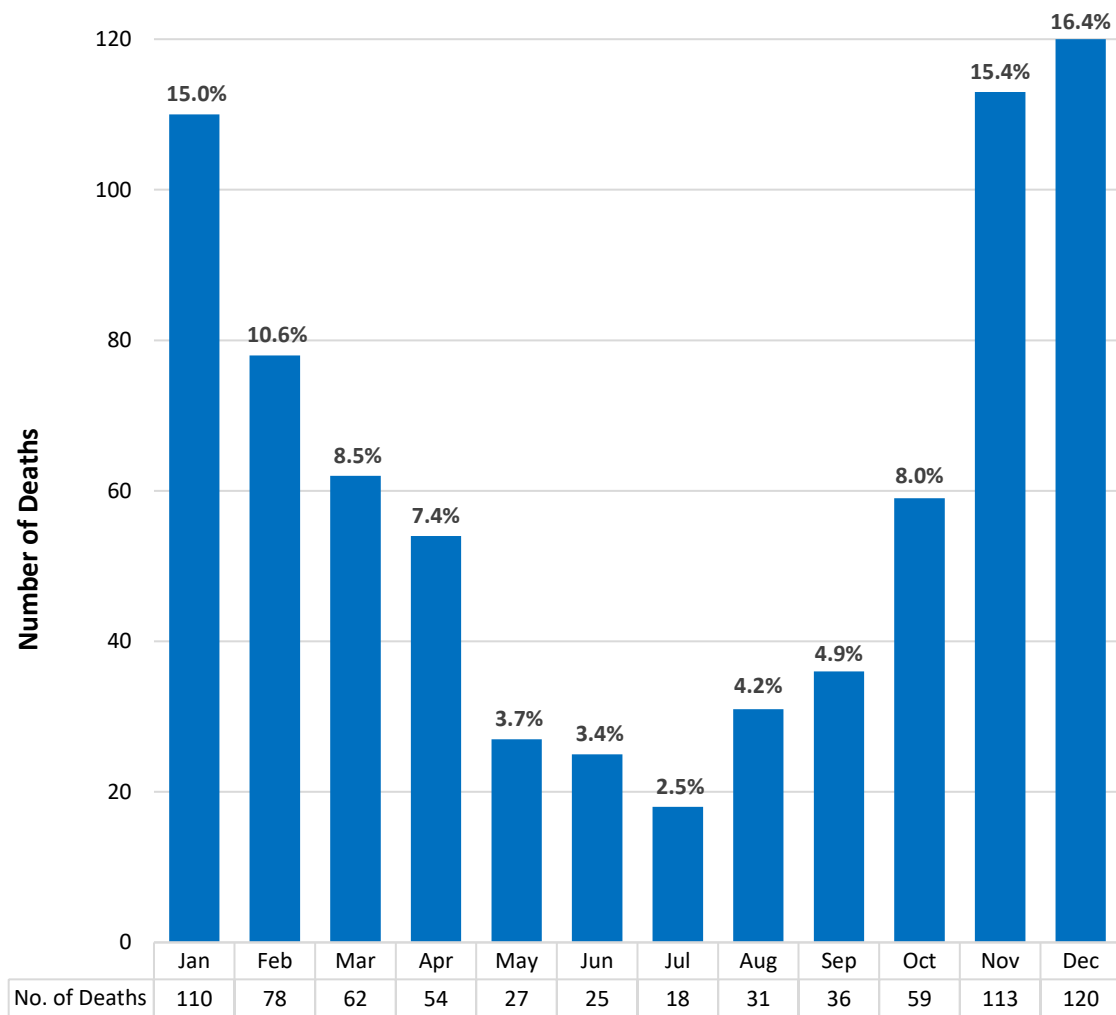


Changes in the way that housing statistics are collected by the UK devolved nations mean that official statistics on tenure are no longer published for the UK as a whole. However, the dataset at this link was published in April 2024 and does give them for Great Britain (the UK minus Northern Ireland): <https://www.ons.gov.uk/peoplepopulationandcommunity/housing/datasets/dwellingstockbytenureuk> For 2022 this quotes 29.3 million dwellings in Great Britain; an increase of 504,000 dwellings (Over 1.5%) on 2020. Of these, 18.9 million dwellings (64.4%) were owner-occupied dwellings, 5.4 million private rented dwellings (18.5%) and almost 5 million social and affordable rented dwellings (just under 3 million housing association dwellings, that's a little over 10% of all dwellings, and just under 2 million, or 6.8%, were rented from Local Authorities).

CO-Gas Safety comment

Although the figures above relate to Great Britain and our data covers all of the UK, it is interesting that within the rental market unintentional CO deaths in both housing association dwellings and privately-rented properties look low (3% & 10%) compared to the numbers of these properties in the GB housing stock (10% & 18.5%, respectively). This may infer that private rental legislation is becoming more effective than LA management of their property safety. However, it should also be said that we are unaware of any deaths in confirmed council-owned properties in Great Britain for over ten years. The number of cases in our data with unknown tenure (12%) could account for some anomalies, and our tenure data also includes locations not included in the official statistics, such as boats, tents and cars, which will affect percentage figures. In order to establish accurate conclusions, it would be really helpful to have even more co-operation from coroners and ONS (Office for National Statistics) to record the tenure of dwellings which, of course, the government could require.

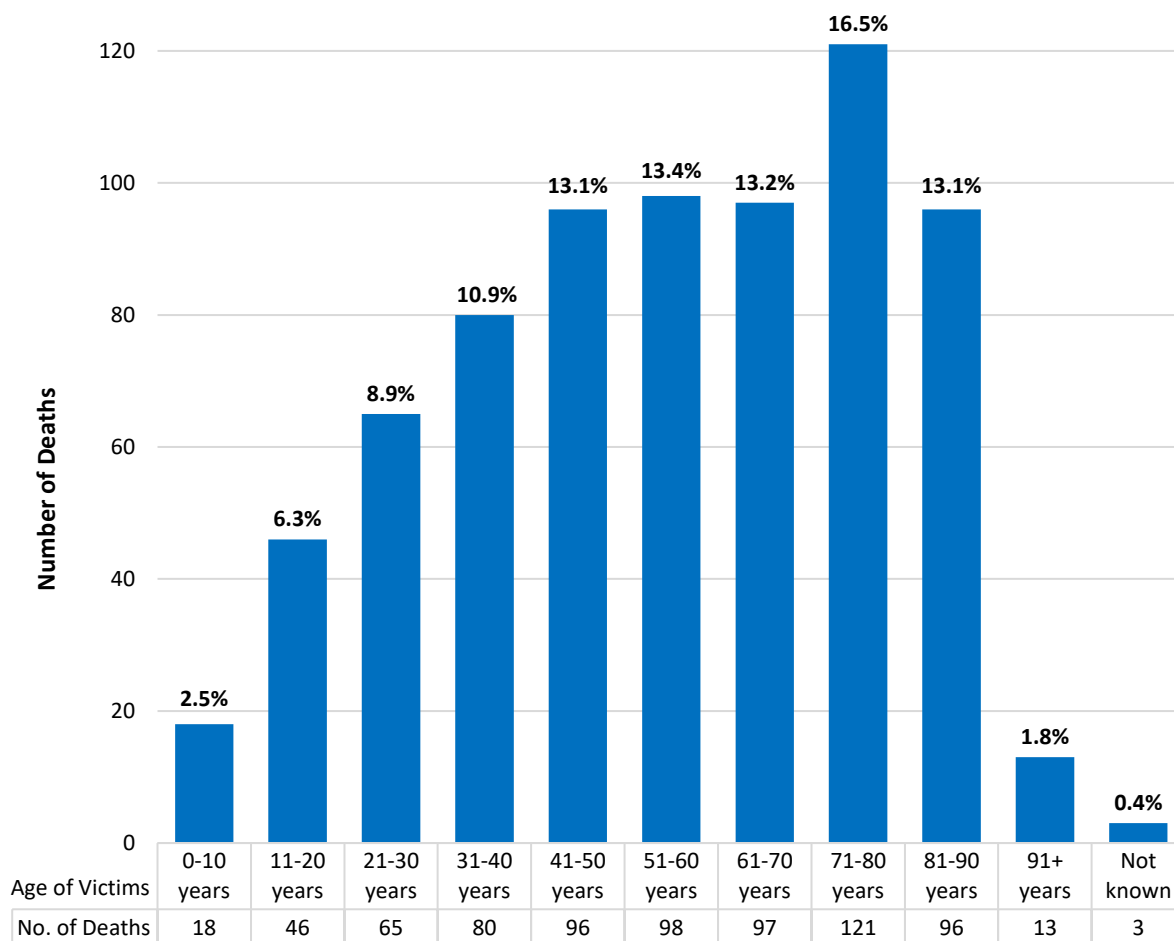
MONTH OF DEATH relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2024



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 31.08.2024



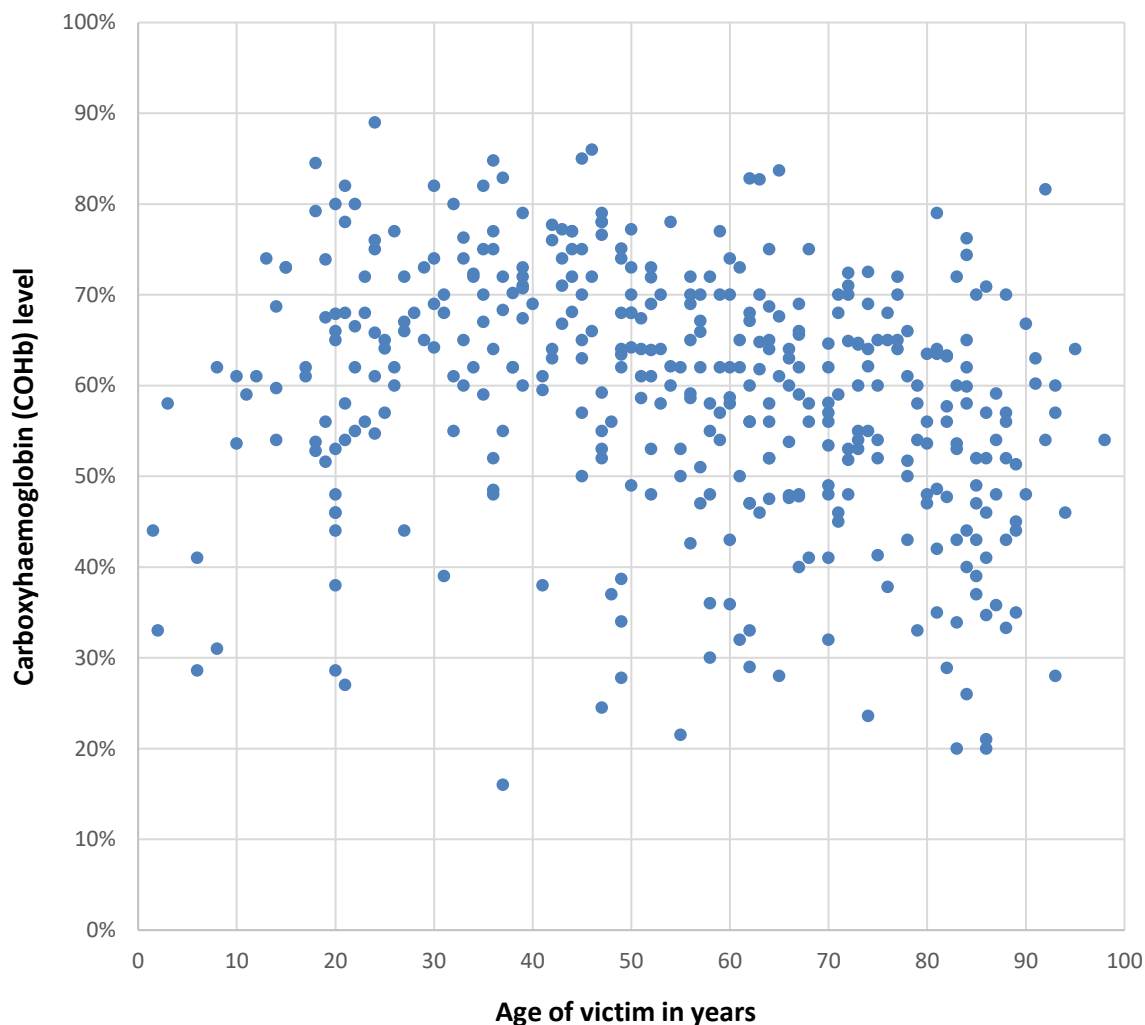
CO-Gas Safety comment

We note that those aged 71-80 years make up just over 8% 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 and above this particular age group could be even higher.

*Taken from ONS Census 2021 Demography and Migration Data, England & Wales: Dataset TS007 Age by single year.
<https://www.ons.gov.uk/releases/demographyandmigrationcensus2021inenglandandwales>

The CO Research Trust (formerly the Gas Safety Trust) agreed to fund a pilot which originally sought to develop a protocol to test all dead bodies for CO. This started in early 2016 but was revised due to the rules on coroners participating in research, and the need to reflect and capitalise on recent legislative changes, particularly the introduction of the Medical Examiner’s role. In 2022 the Trust published the outcome of this work, which gives an overview of the coronial system, and highlights areas for change and improvement which will improve how CO is detected and recorded within the coronial system. A number of these areas are being taken forward including work on the ICD 11 coding. You can read the final report, and watch a presentation on the findings, on the Trust’s website. <https://www.coresearchtrust.org/our-research/cranfield-university-the-efficient-operation-of-regulation-and-legislation-an-holistic-approach-to-understanding-the-effect-of-carbon-monoxide-on-mortality>

COHb LEVEL OF VICTIMS relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2024



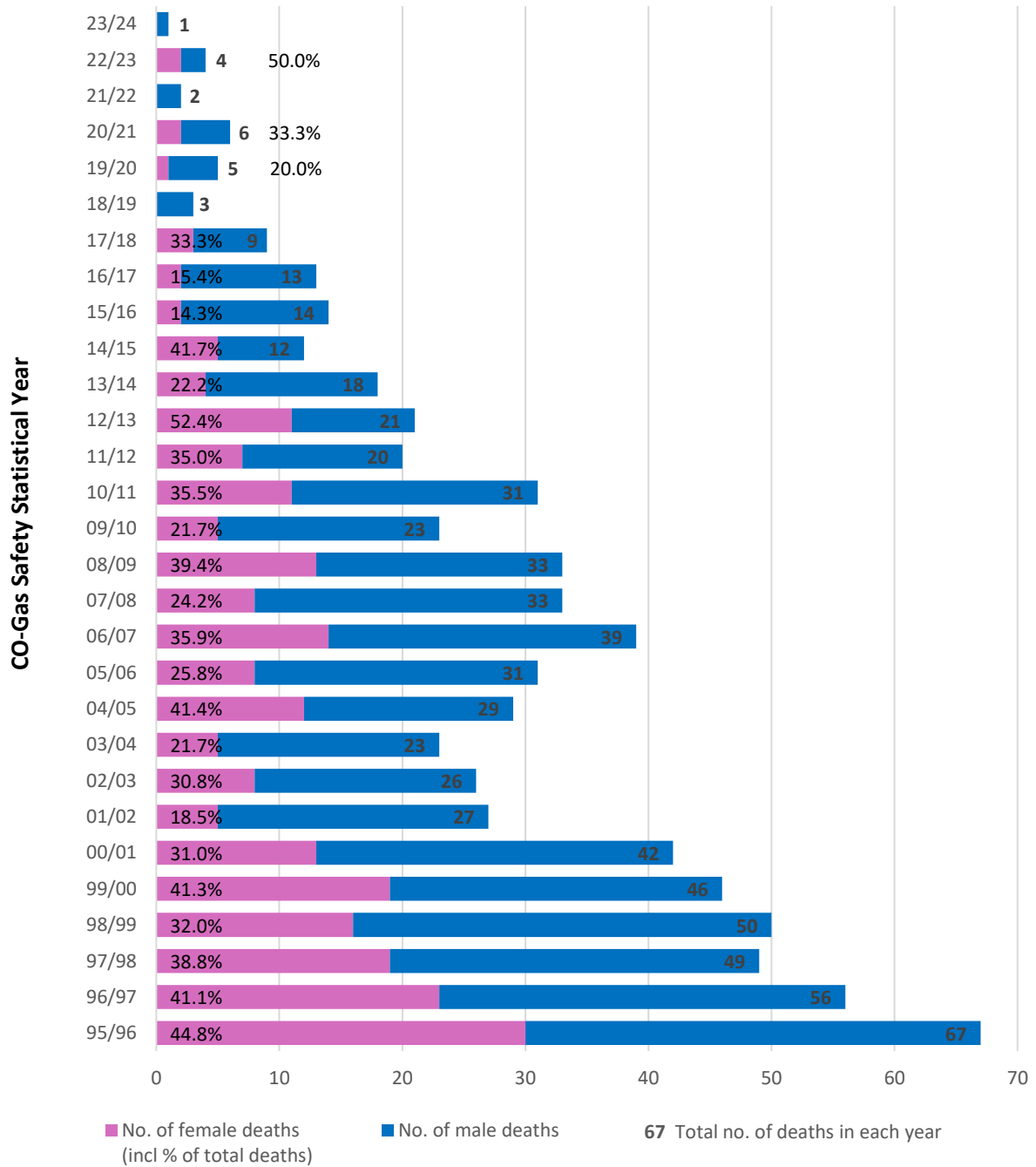
CO-Gas Safety comment

For this analysis we now have data available for 400 victims. We are hopeful that the continued recording of COHb levels in our database is of interest to the scientific community.

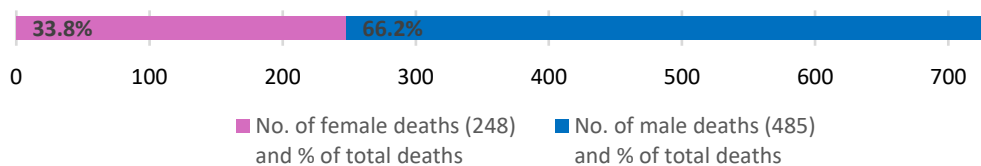
We now have a COHb % for 84% of the fatalities we have recorded over the last ten years (since 31.08.2014). We have a COHb % for all of the deaths we have concluded documenting over the last five years. Coroners do seem to want to confirm COHb where CO is suspected and the body makes testing viable, but they don't necessarily test in cases where CO does not immediately look obvious from visual markers.

CO-Gas Safety would like to see more widespread testing of deceased bodies for COHb. CO remains surprisingly stable in a dead person for days, weeks or even longer. Baroness Finlay, co-chair of APPCOG, recommended this in 2011 (see recommendation 7). After many months of trying to quantify the expense of testing, we eventually found the cost of conducting such a test from one lab, who quoted £32.50 in 2022.

GENDER OF VICTIMS relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2024



Total deaths by gender 01.09.1995 - 31.08.2024



LOCATION OF INCIDENT relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2024

ENGLAND	No. of deaths	WALES	No. of deaths
Bedfordshire	1	Clwyd	6
Berkshire	7	Dyfed	23
Buckinghamshire	8	Gwent	20
Cambridgeshire	6	Gwynedd	8
Cheshire	6	Mid Glamorgan	16
Cornwall	22	South Glamorgan	6
Cumbria	20	West Glamorgan	13
Derbyshire	27	TOTAL	92
Devon	11		
Dorset	7	SCOTLAND	No. of deaths
Durham	8	Borders	2
East Riding of Yorkshire	3	Central Scotland	2
East Sussex	11	Fife	7
Essex	21	Glasgow	3
Gloucestershire	6	Grampian	1
Greater London	65	Highlands and Western Isles	1
Greater Manchester	18	Lanarkshire	4
Hampshire	9	Lothian	3
Herefordshire	2	Renfrewshire	2
Hertfordshire	12	Tayside	3
Kent	29	Unknown Scottish Location	2
Lancashire	18	TOTAL	30
Leicestershire	8		
Lincolnshire	17	NORTHERN IRELAND	No. of deaths
Merseyside	7	County Antrim	7
Norfolk	20	County Armagh	1
North Yorkshire	17	County Down	6
Northamptonshire	2	County Fermanagh	5
Northumberland	5	County Londonderry	2
Nottinghamshire	11	County Tyrone	4
Oxfordshire	14	TOTAL	25
Shropshire	10		
Somerset	13	England	586
South Yorkshire	33	Wales	92
Staffordshire	25	Scotland*	30
Suffolk	5	Northern Ireland	25
Surrey	4	TOTAL UK DEATHS	733
Tyne & Wear	12		
Warwickshire	7		
West Midlands	15		
West Sussex	8		
West Yorkshire	23		
Wiltshire	9		
Worcestershire	4		
TOTAL	586		

*Note that Scotland does not have a Coronial system as the other UK countries do. Instead, it holds Fatal Accident Inquiries for a much smaller proportion of deaths (total of 40-70 FAIs per year but often not even one inquiry about a CO death). It is likely that this contributes to the lower rate of CO deaths recorded in Scotland.