
**CROSS GOVERNMENT GROUP
ON GAS SAFETY AND CARBON
MONOXIDE (CO) AWARENESS**

ANNUAL REPORT 2017/18

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Introduction

The Cross Government Group on Gas Safety and Carbon Monoxide (CO) Awareness was established to ensure a joined-up approach across departments, the devolved administrations and other governmental bodies to improve gas safety and tackle CO risks from all fuels.

The Group, whose members are listed below, also aims to develop effective Government strategies and promote knowledge and understanding of gas safety and CO risks and how to manage them.

- Department for Business, Energy & Industrial Strategy (BEIS)
- Ministry of Housing, Communities and Local Government (MHCLG)
- Department of Culture, Media and Sport (DCMS)
- Department of Health and Social Care (DHSC)
- Health and Safety Executive (HSE)
- Health and Safety Executive for Northern Ireland (HSENI)
- Health Protection Scotland (HPS)
- Home Office
- Office of Gas and Electricity Markets (Ofgem)
- Public Health England (PHE)
- Scottish Government
- Welsh Government
- Public Health Wales (PHW)

Gas safety and more broadly CO awareness is a cross government issue with the majority of Government departments, the devolved administrations and other governmental bodies having an interest from their particular perspective. This report provides a summary of relevant work carried out by members of the Cross Government Group, under four key headings:

- Consumer Awareness
- Supporting Professionals
- Research
- Legislation and Securing Justice

The activities in this Report cover the period Autumn 2017 to Autumn 2018.

A representative from the Cross Government Group attends the meetings of the All Fuels Forum, which was created to facilitate meetings between the All Party Parliamentary Carbon Monoxide Group (APPCOG) and other stakeholders to encourage debate and action on issues relating to CO. Further information can be found at: <http://www.policyconnect.org.uk/appcog/>

The Cross Government Group maintains a watching brief on current initiatives that will be useful or of interest and when possible invites a representative involved in gas safety or CO issues to provide an update of their work.

Carbon monoxide poisoning is a serious and preventable form of poisoning. Each year there are about 25 deaths from accidental CO poisoning in England and Wales (ONS Statistics)¹ and

¹ The figure of '25 deaths a year' used in this report is based on the average number of accidental poisonings by other gases and vapours (X47) and where the secondary cause of death was the toxic effect of carbon monoxide (T58) from 2010-2017

in excess of 200 non-fatal cases that require hospitalisation. Further statistical data from DHSC (covering England and Wales), HPS, HSENI and HSE is provided in the final section of this Report.

CONSUMER AWARENESS

Health & Safety Executive (HSE) and Health & Safety Executive Northern Ireland (HSENI): Gas Safe Register

The aim of the Gas Safe Register is to protect people from unsafe gas work. This is done partly through the inspection of gas work, and investigation of reports of illegal gas work. The Register also keeps people safe by raising levels of awareness – both of gas safety issues overall and of the Gas Safe Register brand.

During the reporting period of this Report, the Gas Safe Register has returned to the kind of high-profile brand-building campaign it used when launching the brand in 2009. The *Don't Cut Corners* campaign, which is still underway, focuses the public's attention on the risks of illegal gas work and encourages the use of registered businesses.

The *Don't Cut Corners* campaign runs alongside, but separate from, the other awareness raising campaigns undertaken and coordinated by the Register, primarily *Gas Safety Week*.

The *Gas Safety Week* campaign continues to be the dominant campaigning activity within the industry and year on year we see more activity being delivered by supporters rather than purely depending on the Register as the sole source of campaigning action. This broadening of the network means that a wider set of gas safety and CO messages are being carried to new audiences.

Among the assets produced for the 2018 campaign was a new consumer video showing how CO can spread within a property. This visualisation highlights a key message that you cannot see, smell or taste CO. It can be viewed on the Gas Safe Register YouTube channel here: <https://www.youtube.com/watch?v=Xt-kQ0wxJGU>

We have also seen more interest in Gas Safety Week from parliamentarians, in Westminster and more recently at Holyrood, which reflects growing awareness of gas safety and CO.

The Register continues to engage with the industry through a number of forums, including the APPCOG, with a particular focus on better coordination of industry campaigning (ongoing industry campaigns around safety at festivals being a case in point where several parties are operating the same space, and action could be coordinated more effectively).

Key statistics

- 75,000+ registered businesses, 132,000+ registered engineers
- 400,000+ calls to Gas Safe Register Contact Centre
- 1.2million Building Regulations notifications

Website

- Sessions - 3.4million
- Page views - 24million+
- Most viewed pages - 1. Homepage 2. Find an engineer 3. Sign-in (for engineers)

Social media

- Twitter GSR (verified account) - 26,000+ followers
- Facebook GSR (Verified account) - 37,000+ followers
- LinkedIn - 4,000+ followers
- Instagram - 5,100+ followers
- YouTube - 725 subscribers and 494,000 video views

HSE: Domestic gas e-Bulletin

Since last year's report, subscription to HSE's Domestic gas e-Bulletin has risen from approximately 36,000 to over 41,000 <http://www.hse.gov.uk/gas/ebulletin.htm>.

HSENI: Carbon Monoxide Awareness Month

November 2017 was the fifth year of the Northern Ireland Carbon Monoxide Awareness Month. HSENI continued to support CO awareness via social media reminding the public to keep chimneys and flues swept and what to do if they suspect CO may be present in their home. Other messages highlighted the range of appliances which may produce CO if not maintained:

The poster features a large orange circle on the left containing the text 'WATCH OUT' with a warning triangle, 'CARBON MONOXIDE AWARENESS MONTH NOVEMBER', and the website 'www.hseni.gov.uk/watchout'. Below the text is a cartoon dog holding a sign. To the right, the text reads 'Common sources of CO include the following wood, oil or gas fuelled appliances:' followed by a list of appliances: Boilers, Room heaters, Furnaces, Charcoal grills, Cooking ranges, Water heaters, Vehicles run in closed garages, Fire places, Portable generators, and Wood burning stoves. At the bottom right are three icons: a boiler, a room heater, and a fire place.

HSENI Carbon Monoxide Month activity on Social Media

Facebook: Total *reach on Facebook was 9,743

**Definition of total reach is calculated based on the unique number of people who could have potentially seen the updates.*

Twitter: Total *Impressions on twitter was 7,277

**Impressions: times a user is served a Tweet in their timeline or search results.*

HSENI Gas Safety

Continued expansion of the natural gas networks led to further planned and reactive inspection visits within the natural gas transmission and distribution sectors of the industry to ensure compliance. In partnership with the Gas Safe Register proactive and reactive visits and inspections were completed in the downstream private industrial and commercial sectors with enforcement action being pursued as necessary. During 2017/18 HSENI continued to remind dutyholders and members of the public of the risks from CO poisoning as part of their routine work. CO awareness is not restricted to gas installations and includes other fossil fuel burning appliances.

Public Health Agency and Local Authorities

The Public Health Agency of Northern Ireland, in association with local councils, Department of Health, Health and Social Care Trusts and RoSPA, issued a timely summer reminder to the many families who go camping, caravanning or boating, and the subsequent dangers of CO poisoning.

The public were reminded that while CO is usually associated with domestic fossil fuel burning appliances, everyone should be aware that in holiday homes, caravans and on boats, faulty gas cookers, appliances or petrol-powered generators can also lead to CO poisoning. The dangers of bringing gas and charcoal BBQs into tents and other small enclosed spaces were also highlighted.

Throughout 2017/18 Home Safety Officers, employed by Local Councils with funding support from the Public Health Agency, provided a free and confidential home assessment service to those most at risk of a home accident. These vulnerable groups included families with children under the age of 5 years, persons over 65 years and households with other vulnerable people.

In 2017/18, 6,137 homes were visited and in 5,194 of these homes, CO was identified as a potential hazard due to the presence of a CO-producing appliance located in the house or adjoining garage. Around 38% of the homes (2,209) did not have a CO alarm, with older people (47%) being less likely to have alarms in place than families with children under 5 (33%).

Advice was given to all relevant homes and around 2,500 leaflets were provided. In addition, 1,698 low income households and vulnerable groups who were assessed as being at risk were provided with CO alarms. The CO alarms were distributed along with relevant promotional materials thus assisting in the education and protection of vulnerable households identified during home safety checks as being most at risk of CO poisoning.

Welsh Government/Public Health Wales(PHW): general activities

PHW continues to develop a Wales-wide CO surveillance system to inform understanding of the burden of CO and facilitate targeted interventions. In the period 1 September 2017 to 31 August 2018 11 CO-related incidents have been recorded by the Environmental Health Protection team of PHW.

PHW also publishes comprehensive information on their website to remind health professionals about reporting CO related incidents, along with general information for the public and professionals on the dangers of CO, the signs and symptoms and steps to take to avoid CO poisoning.

<http://www.wales.nhs.uk/sitesplus/888/page/50368>

Welsh Government: CO website pages

<http://gov.wales/topics/health/protection/environmental/carbon/?lang=en>

The webpage for CO has been revised and includes:

- Advice to health professionals on the diagnosis of CO poisoning.
- A leaflet for the general public on CO poisoning.
- Links to the NHS Direct, Public Health England and Public Health Wales web pages on CO poisoning.

A cross-reference link to the Welsh Government webpage on Schedule 1 of the Building Regulations about heat producing appliances, which includes information on:

- CO alarms;
- maintaining household appliances; and
- chimneys, flues and air vents.

Office of Gas and Electricity (Ofgem)

Ofgem seeks to encourage licensed gas supply and network operator companies to increase consumer awareness of the dangers of gas and the use of gas and has a number of mechanisms in place to achieve this.

This includes licence conditions that require gas supply companies to regularly and on request provide information on the safe use of gas appliances; the dangers of CO; the benefits of suitable CO alarms and gas safety checks; and where to seek advice regarding faulty gas appliances.

Ofgem also operates the Gas Discretionary Reward Scheme (DRS) under the RIIO-GD1 regulatory framework that encourages gas distribution network companies (GDNs) to help address a range of social, CO safety, and environmental issues.

Every three years GDNs can apply for rewards for initiatives they have undertaken. With the support of an independent panel, Ofgem reviews the GDNs' submissions and determine whether and by how much to reward the GDNs. The DRS has a maximum reward of £12m available to all the GDNs over the eight-year RIIO-GD1 period. The first award was made in 2015. The maximum total reward available for 2018 was £4m.

Department of Health and Social Care (DHSC)/Public Health England (PHE): Policy and communications

DHSC and PHE attended and provided continuous input to the Cross Government Group on Gas Safety and CO Awareness meetings as well as the APPCOG meetings, on CO policy-related matters.

Activities undertaken by PHE during the reporting period included:

- Providing advice through the PHE *Keep Warm, Keep Well leaflet*, which contains information and advice for the public on CO safety around ensuring gas appliances are properly serviced and installed by qualified gas engineers, installation of CO detectors, dangers of solid fuels and where to find registered engineers. There are also links to webpages where the public can find more information on CO safety.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/748499/keep_warm_keep_well_2019.pdf
- Raising public awareness on the dangers of using diesel or petrol-powered generators indoors to either pump flood water out of buildings or to dry the interior of a building after flooding. (<https://www.gov.uk/government/collections/flooding-health-guidance-and-advice>)
- Supporting the *Carbon Monoxide Awareness Week* through social media, advising people how to reduce their risks of being poisoned during winter and providing links to the <https://publichealthmatters.blog.gov.uk/2015/12/15/carbon-monoxide-the-silent-killer/> and https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/401980/flood_leaflet_2015_final.pdf.
- Launching the *Cold Weather Plan*, which included CO messages and can be found at <https://www.gov.uk/government/publications/cold-weather-plan-cwp-for-england>
- Circulating the Cold Weather communications toolkit to local authorities and the NHS, which included messages about getting appliances checked before winter.

SUPPORTING PROFESSIONALS

Public Health England (PHE) - National Poisons Information Service (NPIS)

The National Poisons Information Service (a service commissioned by PHE on behalf of UK health services) Annual Report 2017/18 includes information on CO poisoning. Carbon monoxide poisoning is one of the major public health poisoning problems dealt with by the NPIS.

Since July 2015, NPIS has undertaken a project funded by the Gas Safety Trust to obtain more information, in particular confirmation of exposure, from healthcare professionals contacting the NPIS. Data is collated from telephone enquiry data via the UK Poison Information Database and follow-up questionnaires posted directly to all enquirers. Overall, in the period July 2015 to December 2017, data was collated and evaluated for 2,074 patient-related cases following exposure to CO in the UK.

During the period January 2017 to December 2017, data was available for 835 patient-related exposures, of which 808 (96.7%) were unintentional. When smoke/fire as the source of CO was excluded (n=90, 11.1%), the majority of unintentional exposures were associated with domestic boiler issues (174, 24.2%), gas appliances (67, 9.3%), vehicle exhaust fumes (63, 8.8%) and domestic wood/coal fire burners (43, 6.0%). Activation of a CO alarm prompted patients to seek medical attention in only 128 (15.8%) cases.

The most prominent effects were central nervous system symptoms (250, 29.9%, patients presenting with one or more symptoms), followed by effects on the gastrointestinal system (108, 12.9%), respiratory effects (44, 5.3%) and cardiovascular effects (41, 4.9%). Blood carboxyhaemoglobin (COHb) concentrations were reported for 346 (41.4%) patients.

<http://www.npis.org/NPISAnnualReport2017-18.pdf>

PHE - Health Protection Directorate – Centre for Radiation, Chemicals & Environmental Hazards (CRCE)/ Environmental Hazards and Emergencies Dept (EHE)

Cold related materials

The cold weather plan for England, which is a cross governmental framework coordinated by PHE (Extreme Events and Health Protection Group), contains information and advice around CO safety, specifically at Level 0 – year-round planning. For example, the following are topics contained within actions for individuals:

- Servicing of all gas, solid fuel and oil appliances by registered engineers.
- Checking chimney and flues for blockages.
- Fitting audible CO alarms.

PHE Flooding materials

PHE (Extreme Events and Health Protection Group) contribution to the flooding and health chapter of the *National Flood Emergency Framework for England* contains lines on the dangers of using diesel or petrol-powered generators indoors to either pump flood water out of buildings or to dry the interior. This danger is also highlighted in Annex E – Communications guide, within that document.

This aspect is repeated in the On-call duty doctor's pack (internal PHE resource) and the web-learning module on flooding, further supporting professionals.

PHE Health Improvement Directorate, Alcohol, Drugs, Tobacco & Justice Division

Implementation of NICE guidance on reducing smoking in pregnancy

There is strong collaboration between PHE and NHS England, to support the implementation of National Institute of Health and Care Excellence (NICE) guidance on smoking in pregnancy (PH26). Recommendation 1 in this guidance is for midwives to conduct a CO test with ALL pregnant women as part of the process for identifying those who smoke or are exposed from other sources. Those with elevated levels should be referred via an opt-out system for specialist support to stop smoking, or further discussions initiated regarding potential exposure to CO if not from smoking.

Improving implementation of NICE Guidance is a priority in the new Tobacco Control Plan for England, the Maternity Transformation Programme and the Saving Babies Lives care bundle (to reduce stillbirth). A range of new resources are available to support maternity teams, which are designed to enhance communication skills and support practitioners to effectively raise the issue and conduct brief meaningful conversations about smoking. This includes an on-line training module, which is now available on three different platforms to improve accessibility, a series of infographics and animations and a self-assessment tool to help review local systems. PHE and NHS England are working through regional and local networks to support ongoing improvements in routine CO screening in maternity services.

Guidance:

<https://www.nice.org.uk/guidance/ph26>

<https://www.gov.uk/government/publications/towards-a-smoke-free-generation-tobacco-control-plan-for-england>

Training modules:

http://elearning.ncsct.co.uk/vba_pregnancy-launch

<https://www.e-lfh.org.uk/programmes/smoking-in-pregnancy/>

<http://www.ilearn.rcm.org.uk/enrol/index.php?id=259>

Smoking in Pregnancy Challenge Group resources

The Smoking in Pregnancy Challenge Group has produced resources and publications to inform women of the risks of smoking in pregnancy, including CO exposure. The most widely used is the “test your breath” postcard that informs pregnant women about the risks of CO and the CO test, which is now available in ten different languages. Maternity services can order these directly and, in some areas, the postcards are being included in booking packs. There are also tools for maternity staff and commissioners, including reports on the situation across England with recommendations for local and national actions, training guide and a briefing on e-cigarettes.

Resources: <http://smokefreeaction.org.uk/smokefree-nhs/smoking-in-pregnancy-challenge-group/smoking-in-pregnancy-training-materials/>

PHE: meetings

On 11 October 2017, a PHE representative from EHE/CRCE sat on the panel organised by the APPCOG for the launch of its report on *Carbon Monoxide Poisoning: Saving Lives, Advancing Treatment – A Call For Action Across The Healthcare Sector*. The report was produced by the Group’s Stakeholder Forum’s Medical Sub-Group (COMed).

PHE representatives from the EHE/CRCE and Toxicology Departments attended the launch of the International Carbon Monoxide Research Network, which was organised on 2 May 2018. The launch was supported by the Gas Safety Trust (GST).

Welsh Government/Public Health Wales

PHW is actively engaged in responding to CO-related incidents alongside partner organisations such as local authorities, fire and rescue services and the Welsh Ambulance Service. PHW reviews the response to all CO-related incidents of which it is notified with the objective of improving response where needed.

The Welsh Government continues to provide comprehensive CO advice for health professionals on its website at <http://gov.wales/topics/health/protection/environmental/carbon/?lang=en>, which includes information on diagnosis, investigations and management of suspected poisonings from CO at <http://gov.wales/docs/phhs/publications/151113copenisoningen.pdf>.

In November 2017, the Welsh Government issued a Welsh Health Circular (WHC (2017) 051) on behalf of the Chief Medical Officer and Chief Nursing Officer for Wales to all health professionals in Wales encouraging their vigilance to the signs and symptoms of CO poisoning in their patients (<http://gov.wales/topics/health/nhswales/circulars/health-professional/?lang=en>).

The letter also alerted them to the availability of a diagnostic algorithm (see the following paragraph). An item was also included in the weekly Welsh Government email news service to schools to raise awareness of the symptoms of CO poisoning. The Chief Medical Officer for Wales also issued a number of tweets on the subject.

PHW: Algorithm for health professionals

PHW has produced an algorithm to support medical/health professionals in identifying and managing suspected CO poisoning in their patients. This was redistributed via Welsh Health Circular WHC(2017) 051. This algorithm is available on Public Health Wales's CO awareness web pages at <http://www.wales.nhs.uk/sitesplus/888/page/50368>.

RESEARCH

PHE - Health Protection Directorate – CRCE/ Toxicology Department

As part of the National Institute for Health Research (NIHR) Health Protection Research Units (HPRU), PHE scientists have been undertaking a study of foetal carboxyhaemoglobin (CO-fHb) levels in blood spot samples collected from neonates in the catchment area for the John Radcliffe Hospital, Oxford. This is both a feasibility study and will also serve as an indicator of incidence of elevated CO-fHb levels.

PHE has received Gas Safe Trust (GST) funding together with Frimley Park Hospital, St Georges University London SGUL, University of Surrey and others for a study of incidence of elevated CO-Hb levels in patients attending these two emergency departments. The project will be used to:

- Validate the COMA (Companions, Outside, Maintenance, Alarm) mnemonic during triage to identify those patients with symptoms indicative of CO poisoning that are likely to be exposed to CO
- Test novel analytical methods for the quantitation of CO-Hb using GC/MS and high-resolutions mass spectrometry.
- Investigate seasonal effects, undertake some biomarker discovery work using lipidomics and metabolomics and use the elevated CO-Hb levels to trigger premises inspections by gas engineers who will measure ambient CO levels and assess appliances.

The project was delayed whilst a decision on ethics was made.

PHE - Health Protection Directorate – CRCE/ Chemicals and Environmental Effects Department

The Environmental Epidemiology Group has continued to support two projects in 2017:

- A PhD project for study of CO exposure measurement error by a combination of analytical chemistry and epidemiology methods. This is a GST-funded collaboration of PHE with Brunel University and Toxicology Department at Lausanne Hospital, Switzerland on several aspects of CO measurement error. Work undertaken in 2017 focused on errors attributable to variation in forensic chemical analysis and resulted in a publication relevant to post-mortem assessment of CO². In addition, a review on sources of error in CO estimation has been prepared³. A review of errors in measurement of CO exposure in population surveys will be undertaken.
- A PhD project for modelling of CO uptake and elimination started in 2016 and continued in 2017, with, a researcher from Taipei supported by a scholarship from Taiwan government,

² Oliverio S, Varlet V. Carbon monoxide analysis method in human blood by Airtight Gas Syringe–Gas Chromatography–Mass Spectrometry (AGS-GC-MS): Relevance for postmortem poisoning diagnosis. *Journal of Chromatography B*. 2018 Jul 15;1090:81-9

³ Oliverio, Stefania, Vincent Varlet, Ariana Zeka, and Giovanni Leonardi. "PI-3-9 The burden of carbon monoxide exposure on public health: evaluating the role of carboxyhaemoglobin (COHb) as a biomarker and exploring new approaches for quantification." (2018): *Occupational and Environmental Medicine* 75(Suppl 1): A37.3-A38.

Initial work examined risk factors for CO poisoning in Taiwan, in collaboration with National Defense Medical Centre investigators⁴. Further work is ongoing on developing improvements to the multi-compartment model of CO distribution in the body currently available, examining variation in CO uptake and elimination by age, gender, and height. The goal is to improve the performance of the CO multi-compartment model and make it more widely applicable to several public health and clinical settings.

⁴ Ke-Ting Pan, Chih-Hao Shen, Fu-Gong Lin, Yu-Ching Chou, Ben Croxford, Giovanni Leonardi, Hsien-Feng Chang and Kun-Lung Huang. Predictive factors related to the prognosis of carbon monoxide (CO) poisoning in Taiwanese patients. *Submitted*.

LEGISLATION AND SECURING JUSTICE

Ministry of Housing, Communities and Local Government (MHCLG): Review of Carbon Monoxide Alarm Requirements (England)

On 30 April 2018, the Government announced a review of CO alarm requirements. The aim of this review is to consider and update the evidence base to establish whether the current alarm requirements in England should be extended. For details of this announcement see <https://hansard.parliament.uk/commons/2018-04-30/debates/1804303000007/CarbonMonoxideDetectionAndSafety>.

The current regulatory requirements for CO alarms upon the private rental of residential premises having solid fuel appliances and upon the installation of solid fuel appliances in homes regardless of tenure is based on a cost-benefit analysis published in 2010. This analysis showed that solid fuel heating appliances were responsible for a disproportionate number of CO incidents per number of installations compared to other fuels.

The review will consider the evidence base to establish whether these current regulations are fit for purpose or whether alarm requirements should be extended to the installation of oil and gas boilers and to social housing.

The review will include consideration of:

- improvements to and the falling cost of CO alarms;
- any new research that shows whether CO poisonings are wrongly diagnosed as something else and so under-reported;
- and any new evidence on the number of CO incidents that the emergency services attend.

The plan will then be to consider any updates to the evidence base with a view to potentially consulting on any proposed changes in 2019. The terms of reference for this review can be seen at

<https://www.gov.uk/government/publications/carbon-monoxide-alarm-requirements-review-terms-of-reference/carbon-monoxide-alarm-requirements-review-terms-of-reference>

In July 2018, the Government published the outcome of its consultation on operation of the Smoke & Carbon Monoxide Alarm Regulations in the private rented sector. This showed a good awareness of the requirements leading to an increase in the number of CO alarms. Responses suggested that the regulations should be extended to other tenures and that it would be less confusing if extended to all fuel burning appliances. These views will be considered as part of the wider review into CO alarm requirements described above. The Government response to the consultation can be seen at <https://www.gov.uk/government/consultations/review-of-the-smoke-and-carbon-monoxide-alarm-regulations-2015>

In August 2018, the Government published its Green Paper: *A New Deal for Social Housing*. This included seeking views on whether the Decent Homes Standard covers the right issues and whether safety measures introduced into the private rented sector such as CO alarms should also apply to social housing. This can be seen at <https://www.gov.uk/government/news/social-housing-green-paper-a-new-deal-for-social-housing>.

In October 2018, the Government published its Terms of Reference for the CO alarm review and convened a Working Group including representation from other departments, the All-Party

Parliamentary Carbon Monoxide Group, the heating industry and landlord associations. The terms of reference for this review can be seen at:

<https://www.gov.uk/government/publications/carbon-monoxide-alarm-requirements-review-terms-of-reference/carbon-monoxide-alarm-requirements-review-terms-of-reference>

HSE/HSENI: Enforcement activities

HSE continues to work to secure justice and provide consumer protection where gas safety incidents are highlighted. This may be through the issue of an enforcement notice or prosecution in the event of a breach of the law. 10% of HSE's prosecution informations⁵ in 2017/18 were brought under the Gas Safety (Installation and Use) Regulations 1998.

Further information on the HSE website: HSE Public Record of Convictions is at <http://www.hse.gov.uk/Prosecutions/> and the Media Centre <http://press.hse.gov.uk/> includes press releases relating to prosecutions.

HSE and Gas Safe Register: Enforcement

Gas Safe Register supports enforcement activity through incident investigation and operational support; they undertake visits with HSE, HSENI and local authorities. The field operations teams also complete inspections to identify unsafe gas work and assess engineers' competence.

⁵ In health and safety cases, criminal proceedings are commenced by the laying of an Information in the magistrates' court. The Information is normally accompanied by a summons, which is intended to secure the accused's attendance at court, in order to answer the allegation(s) made against him/her contained in the Information.

STATISTICS

This section includes statistical data from the Department of Health & Social Care (DHSC), Health Protection Scotland (HPS), HSE and HSENI on CO fatalities. The various parties use specific, but different criteria in what they record. The figures reflect the differences in the relevant data sources.

The DHSC, HPS, HSENI data is based on public health information and excludes self-harm where that has been coded, but it is likely that self-harm is under-reported.

HSE collects data on incidents which are reportable under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) <http://www.hse.gov.uk/riddor/> (and previously under the 1995 Regulations).

The Regulations apply to events which arise out of or in connection with work activities covered by the Health & Safety at Work etc Act 1974. The Regulations require gas conveyors and Liquid Petroleum Gas (LPG) suppliers to report incidents where someone has died, lost consciousness, or been taken to hospital for treatment to an injury where gas is likely to be a cause.

CO mortality data

On request from PHE and DHSC, Office of National Statistics (ONS) provided the data on mortality from CO poisoning (deaths registered in 2016-2017 in England and Wales). The data is available online at

<https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/adhoc/009122numberofdeathsfromaccidentalpoisoningbycarbonmonoxideenglandandwalesdeathsregisteredin2017> (reference 009122)

Carbon monoxide poisoning is a serious and preventable form of poisoning. Each year there are **around 25 deaths** from accidental CO poisoning in England and Wales (ONS Statistics)⁶.

PHE have compiled mortality statistics from the Office of National Statistics for accidental CO poisoning 2005-2017.

For information on Northern Ireland CO data please contact Health.Protection@health-ni.gov.uk

For information on Scottish CO mortality data, please see <https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/general-publications/vital-events-reference-tables/2017/section-6-death-causes> or contact statisticscustomerservices@nrscotland.gov.uk.

For information on England and Wales CO data, please contact COfeedback@phe.gov.uk

⁶ The figure of 'around 25 deaths a year' used in this report is based on the average number of accidental poisonings by other gases and vapours (X47) and where the secondary cause of death was the toxic effect of carbon monoxide (T58) from 2012-2017.

Number of deaths from accidental poisoning by carbon monoxide, England and Wales, 2010-17 ^{1,2,3}									
Code	Cause	2010	2011	2012	2013	2014	2015	2016	2017
V01-X59	All accidental carbon monoxide poisonings	65	79	65	60	55	53	49	59
X47	Accidental poisoning by other gases and vapours	32	34	25	24	26	25	16	17
	Occurrence at home	23	29	18	16	18	24	13	11
	Occurrence in residential institution	0	0	0	0	0	0	0	0
	Occurrence at school other institution/pub admin area	0	0	0	0	0	0	0	0
	Occurrence at sports/athletics area	0	0	0	0	0	0	0	0
	Occurrence on street/highway	1	1	1	0	0	0	0	0
	Occurrence at trade/service area	0	1	0	0	1	0	0	0
	Occurrence at industrial/construction area	1	0	0	1	0	0	1	0
	Occurrence on farm	0	0	0	0	0	0	0	0
	Occurrence at other specified place	6	3	5	6	5	1	1	4
	Occurrence at unspecified place	1	0	1	1	2	0	1	2
V01-V99	Transport accident	0	0	0	0	0	1	1	2
X00-X09	Accidental exposure to smoke, fire and flames	33	45	40	36	29	27	32	40
¹ Cause of death was defined using the International Classification of Diseases, Tenth Revision (ICD 10). Deaths were selected where the underlying cause of death was accidental (ICD 10 codes V01-X59), and where the secondary cause of death was the toxic effect of carbon monoxide (ICD 10 code T58).									
² Figures for England and Wales include deaths of non-residents.									
³ Deaths registered in each calendar year.									
Source: Office for National Statistics									

The figure of '25 deaths a year' used in this report is based on the average number of accidental poisonings by other gases and vapours (X47) and where the secondary cause of death was the toxic effect of carbon monoxide (T58) from 2010-2017

Scotland: Mortality figures 2008-2017

Carbon monoxide deaths (ICD 10 code: X47) data from the General Register Office for Scotland. Data range 2008–2017

Mortality statistics for accidental CO poisoning in Scotland

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Deaths by CO (X47)*	2	1	2	2	1	0	1	4	2	1

National Records of Scotland, Vital Events Reference Table 6.04

*X47 Other gases and Vapours (Carbon Monoxide)

Northern Ireland: Mortality figures 2011–2017

Deaths from carbon monoxide poisoning¹ 2011–2017

Type of carbon monoxide death	ICD10 Code	Registration year						
		2011	2012	2013	2014	2015	2016	2017
Uncontrolled fire in a building or structure	X00	3	2	3	3	3	-	2
Exposure to controlled fire in a building or structure	X02	2	-	-	-	-	-	-
Exposure to ignition of highly flammable material	X04	1	-	-	-	-	-	-
Exposure to other specified smoke, fire and flames	X08	-	-	-	-	-	1	-
Accidental poisoning	X47	-	1	-	6	3	1	3
Intentional self-harm	X67, X76	1	5	9	1	1	2	1
Assault by smoke, fire and flames (includes arson, cigarettes and incendiary devices)	X97	-	-	-	-	-	-	-
Poisoning by and exposure to other gases and vapours, undetermined intent	Y17	-	-	-	-	-	1	-
Total		7	8	12	10	7	5	6

¹ Deaths from carbon monoxide poisoning have been defined using ICD10 code T58 and where carbon monoxide was mentioned on the death certificate

Health and Safety Executive published statistics

<http://www.hse.gov.uk/statistics/tables/ridgas.xlsx>

Table RIDGAS 1

Flammable gas incidents¹ resulting in injury reported in Great Britain 2013/14 – 2017/18p
Source: Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR)

¹ An incident can cause more than one fatality or injury

Type of incident		Year				
		2013/14	2014/15	2015/16	2016/17r	2017/18p
Total number of incidents		211	161	178	154	129
	Carbon monoxide poisoning	188	138	146	122	100
	Other exposure, eg to unburnt gas	3	3	6	4	-
	Explosion/fire	20	20	26	28	29
Total number of fatalities		6	6	8	-	2
	Carbon monoxide poisoning	3	6	7	-	1
	Other exposure, eg to unburnt gas	-	-	-	-	-
	Explosion/fire	3	-	1	-	1
Total number of non-fatalities		356	240	261	263	193
	Carbon monoxide poisoning	329	214	225	222	154
	Other exposure, eg to unburnt gas	5	3	7	5	-
	Explosion/fire	22	23	29	36	39

Notes

Statistics presented in these tables are for gas-related incidents in Great Britain reportable under the Reporting of Injuries, Diseases and Dangerous Occurrence Regulations (RIDDOR). For more information see www.hse.gov.uk/statistics/sources.htm

Key changes to the reporting system and the legal requirements for RIDDOR have occurred in recent years. More information on data changes affecting RIDDOR statistics is available at: www.hse.gov.uk/statistics/riddor-notification.htm

r =revised, p=provisional

Flammable gas incidents resulting in injury: Table 1 presents annual reported gas-related incidents that are notifiable under Regulation 11(1) of RIDDOR; this places a duty on certain conveyors of gas (including LPG), to notify HSE of an incident involving a fatal or major injury that has occurred as a result of the distribution or supply of flammable gas (mainly piped gas but also includes bottled LPG). The statistics published are 'as reported' to HSE. When such reports are made, it is at the early stages of the incident, thus the detailed circumstances of the incident will not have been confirmed.

General information on domestic gas safety is available at: <http://www.hse.gov.uk/gas/domestic/index.htm>

Statistics on HSE prosecutions by legislation (including gas safety) are available at www.hse.gov.uk/statistics/tables/prosecutions.xlsx - Table 5

HSE also provides details of members of the public who have died in reportable domestic gas incidents on their website. For 2017/18 <http://www.hse.gov.uk/foi/fatalities/2017-18.htm>