CO-Gas Safety's 24th Anniversary 1995-2019

23 Years of Data of Deaths & Injuries from Unintentional Carbon Monoxide Poisoning 01.09.1995 – 31.08.2018

Picture by John O'Leary www.johnolearyillustration.co.uk

So far our data shows that, per user, more people die from CO from burned solid fuel than gas.

Press pack kindly sponsored by npower

CO-Gas Safety's Carbon Monoxide Awareness Competition now kindly run by

A Poem about Carbon Monoxide
By Lewis Moger

This is a rhyme about a killer that's really very small.
It crept in from the boiler and out into the hall.
Up the stairs it drifted, looking for it's prey
Into different bedroom's where all the family lay
Sleeping soundly in their beds the family stood no chance.
The killer was upon them, it gave them one last glance.

Silently, it took them from this world we know.
One by one, not a care, no more life to grow.
Such a waste, lives are ended.
This could have been prevented.

You have an alarm for a fire, even for a thief.
Get protection from this killer to save a family's grief.
The killers name is carbon monoxide, the family never woke
Get an alarm, keep it tested, the alternative is no joke

School: Ysgol Gymraeg Bro Allta
Teacher: Steffan Jones
Age: 10
KS2

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The Carbon Monoxide & Gas Safety Society (CO-Gas Safety) is an independent charity committed to reducing deaths and injuries from Carbon Monoxide and other gas dangers worldwide and supporting gas related accident victims.

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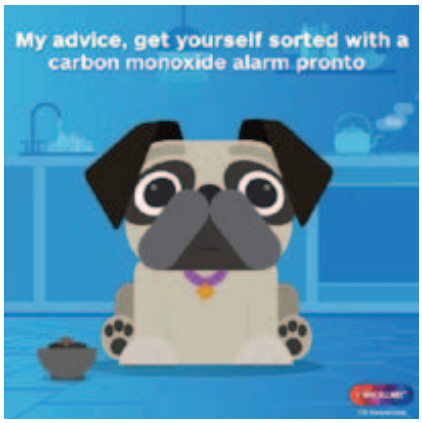
CO-Gas Safety's 23 years of data on deaths and injuries from Unintentional Carbon Monoxide poisoning 01.09.95 – 31.08.18

Press Pack 2018 – 24th Anniversary pack
Dedicated to the memory of all those who have died or suffered from carbon monoxide poisoning and other products of combustion (CO+) their families & friends.

npower understands the need for the public to be aware of the dangers of Carbon Monoxide and fully supports CO-Gas Safety's mission to ensure that the UK public are best placed to minimise incidents of Carbon Monoxide poisoning and accidental deaths.

Numbers continue to reduce year on year of CO poisoning, but it is not yet eradicated, and it's important for people of all ages to be aware of the symptoms and recommended action to take. There can, sadly, be tragic consequences as a result of CO poisoning.

When we hear stories of people impacted by CO poisoning we learn that often people were simply not aware of the dangers that different gas and solid fuel appliances can pose in the home. We continue to communicate the risks that can be avoided across a range of media channels including online and press to raise awareness of this important topic.



This year our social media CO awareness campaign focussed on CO poisoning symptoms on pets. Please visit https://www.npower.com/blog/2018/11/19/is-carbon-monoxide-poisonous-for-pets/ The videos in the campaign showed animated pets discussing their experiences of CO exposure, based on real life experiences of their owners and urged viewers to get a CO alarm and ensure that household appliances are regularly serviced and maintained. The animated approach allowed people to positively engage whilst still taking in the serious messages. This campaign was particularly successful at engaging with a younger audience on the social media platform Instagram. The videos were shared countless times on Facebook too, helping to spread the message further and highlighting the dangers and symptoms to look out for. Over 1.3million people had visibility of our social media campaign.

We are proud to work with CO-Gas Safety again on this issue, our Social Energy programme works to provide support to those that need it most, offering tailored and timely support and advice to those in vulnerable situations. This partnership successfully works together to provide information and advice to those that may be unaware of the dangers they face.

Matthew Cole

Head of Customer Vulnerability

Summary of 2018

Deaths from unintentional carbon monoxide (CO) seem to be reducing
Looking back some good things have happened, specifically an encouraging reduction in deaths from unintentional CO poisoning. We do not include victims in our database until the official cause of death has been recorded, often not until the inquest is concluded. This may take years in some cases, so the number of deaths recorded by us for 2017-18 is still very likely to increase, as has 2016-17 since our last press pack. However, the number of deaths officially due to unintentional CO still appear to be falling.

Survivors desperate for medical help
Sadly, more CO survivors contact us after suffering exposure to CO or CO+ (CO & other toxic products of combustion), desperate for medical help. We try to find them appropriate help because it seems, from what they say, most GPs and toxicologists are unaware of CO. We asked for help from the COMed group, a working group of the All-Party Parliamentary Carbon Monoxide Group of MPs (APPCOG), which started in 2013. Unfortunately, COMed do not have any role or authority to provide advice to individuals or make referral recommendations, its focus is to provide policy advice to parliamentarians and the government, including the NHS and PHE. As part of its work the APPCOG has made some good policy recommendations to improve the way the health service can respond to CO incidents. You can see our email correspondence with COMed here - http://www.co-gassafety.co.uk/resources/health-support/

Despite ongoing efforts to improve the ability of the health service to diagnose and treat CO poisoning, victims are baffled by the medical community's lack of action and knowledge and simply crave sympathy and acknowledgement. Thankfully a survivor recommended Dr Ray Perrin to us, who wrote a page for this press pack, see page 39, but this technique is unlikely to help everyone.

Protocol for Chimney Sweeps
We congratulate the Guild of Master Chimney Sweeps for seeing the problem of leaving evidence undisturbed, see page 7. Their working with us and our victims secured this result and we are grateful to them as leaders of the industry. We look forward to something similar from Registered Gas Engineers.

Review into the training of gas engineers - GETSI
Last January we welcomed the Gas Engineer Training Standards Inquiry (GETSI). Previously, a registered gas engineer (RGE) died using a petrol generator to power his tools and two further deaths, including a ten year old, were caused by a RGE and also from a petrol generator.
At my request Roland Johns, a former British Gas incident investigator and trainer of huge experience and integrity, developed a course on CO from all fuels, winning him & CO-Gas Safety the 2017 H & V Safety Award!
Roland's work can be seen here: http://www.co-gassafety.co.uk/information/gas-installers/
We assumed Roland would be invited to give oral evidence to the parliamentary evidence session or by presenting his course, but sadly neither he nor CO-Gas Safety was invited. Some of those who were invited to give evidence can be seen:-
http://www.policyconnect.org.uk/appcog/sites/site_appcog/files/news/691/fieldnewsdownloads/getsievidencesession-attendeebriefing.pdf. It seems there were no ordinary gas engineers at the parliamentary evidence session, nor any survivors of CO or their representatives, let alone families of fatal victims. In August 2018 Roland and Stephanie met Oona Muirhead & Georgina Bailey of Policy Connect, the company performing APPCOG's administration, and they agreed to interview Roland formally as a follow-up. Since doing so they have informed us that they have reported back to the sponsors of the GETSI inquiry with some findings, including that currently there is insufficient

statistical data on engineer training to draw robust conclusions on the respective merits of different training routes. They advised us that the Gas Safety Industry Group and IGEM propose to use the evidence collected to take measures to strengthen the governance of engineer training, including through collecting additional data.

One year on, we've secured an upcoming meeting in February with Chris Bielby, who was involved in the GETSI and chaired the parliamentary evidence session. We hope we will convince him that any follow up work to the GETSI should include contributions from all stakeholders, particularly those with experience of CO poisoning, who have paid with their health or loved ones' lives due to either negligence or a lack of adequate training.

Separately, Roland trained Tom Bell of Northern Gas Networks on his CO course and Tom has kindly written on page 55 about his talk to a group in Kirklees in July.

Private Member's Bill by Eddie Hughes MP

In 2018 we became involved with Eddie Hughes's private member's bill, making CO alarms compulsory in all rented property and not only those with solid fuel appliances (9% of the privately rented property).

In an article for the New Law Journal in March 2018 I highlighted how landlord gas safety checks can currently be completed legally simply by using visual signs; yet CO cannot be sensed using human senses! (see https://www.newlawjournal.co.uk/content/hidden-killer) Less than 2% of CO in the air can kill in between one and three minutes - see page 26, para 74 and table 23 at the following link: http://www.hse.gov.uk/foi/internalops/hid_circs/technical_osd/spc_tech_osd_30/spctecosd30.pdf. We advocate a legal tidy-up or law change, to ensure annual landlord safety checks require mandatory appliance servicing or testing using a flue gas analyser. We also put forward that if CO alarms were mandatory in all rented properties, they could be tested as part of the mandatory annual gas safety check.

We hope Eddie's bill will receive proper review but understand it may only recommend CO alarms in social housing that has solid fuel appliances (very few exist), or possibly not even this, which would be a huge disappointment.

Separately, our article on various proposed safety changes was published in Gas International (Gi) Magazine's September 2018 issue. http://www.co-gassafety.co.uk/wp-content/uploads/2018/09/Silent-Killer-article-from-Gi_September-2018-002.pdf

Review of our data on fatalities from unintentional CO from all fuels

Since 2015, when we received £50,000 from Thomas Cook at the insistence of the parents following the deaths of Christi and Bobby Shepherd in Corfu in 2006, we have worked hard to review data of deaths from unintentional CO poisoning. Thanks to the kindness of Coroners and their officers, we now have official confirmation for over 90% of our database's fatal cases. However, unless or until there is automatic testing of dead bodies for CO, we will never know the true number.

Our database has also been inspected three times by Dr Carolyn Craggs and again in 2018 by Dr Paul Hewson (arranged through the Royal Statistical Society) whose review is on page 53.

This year we co-operated with Dr Fred Piel, who applied to the Gas Safety Trust to create a map of the deaths. The application was rejected. We felt for Dr Piel but were not convinced a map would be helpful, although a very detailed interrogation of our data might find other factors, such as a greater number of deaths in cities or in areas where coal was historically the primary fuel used domestically.

Thomas Cook
Over the summer we learnt of the tragic deaths of Susan and John Cooper in Egypt while on a Thomas Cook holiday. I am sure many suspected they might have died from CO. It seems the cause was pesticide sprayed in the room next door – see https://www.express.co.uk/news/uk/1016447/egypt-hotel-death-british-couple-thomas-cook-hotel-industrial-insecticide-investigation

The Cooper's daughter, Kelly Ormerod, was well treated by Thomas Cook but still had a problem due to a lack of independent experts and lawyers. After any incident, let alone two deaths, it is vital evidence is not disturbed - Think 'CSI' on TV. In Corfu we were amazed evidence hadn't been disturbed; this meant that the late Harry Rogers, an experienced incident investigator, could, at the parents' expense, undertake an investigation and give evidence at the public inquest in Wakefield.

We had hoped lists of lawyers and investigators would now be kept by our Embassies and Consulates but it seems not. The Safer Tourism Foundation, set up following the Corfu tragedy, seems not to understand why this is needed, as are funds to pay for independent advice and investigation. Frank Brehany (ex Holiday Travel Watch director) and I, met with Thomas Cook and expressed our disquiet. We were also both invited to give evidence to the All Party Parliamentary Group on Deaths Abroad & Consular Services. Sadly, our MP host, Hannah Bardell, couldn't leave Scotland on the day of our evidence so, although we talked to her researchers, we couldn't give official evidence and have not been given another opportunity.

Smart Meters
We continue to campaign about smart meters ever since 2011 because there is a great opportunity to check and test gas appliances before and after installing a new smart gas meter. This request has not been listened to, nor has our request for meter fitters to have personal alarm monitors for CO. Gas emergency service First Call Operatives now do, after we lobbied for them for over 10 years. We understand meter changers usually stop gas supply when they suspect a problem which is better than leaving people in danger but not helpful for householders wanting a safe, continuous supply.

Health & Safety Executive
In November we had a telephone conference with HSE to particularly discuss the Gas Safe Register's (GSR) policy 8.2, which simply states that if work has been done by a Gas Safe registered engineer within the last 6 months you can ask GSR to send an inspector to inspect it.
However, the inspector will not test gas appliances for CO in rented properties unless tenants have landlord permission. Please see https://www.gassaferegister.co.uk/media/2376/consumer-policy-our-services-explained_v61.pdf This is wrong as, in our experience, landlords receiving such requests usually destroy evidence which means the cost of helping someone poisoned by CO falls on taxpayers, not landlords. We ask HSE why they, the licensing body of the GSR, allow such unfair terms to the GSR's policy?

We also find gas engineers qualified to test gas appliances under CMDDA1 assume this policy applies to them, so it's virtually impossible for tenants to obtain an independent gas appliance test for CO!

We also ask HSE to remove the situation where RGEs are only individually registered if they are sole traders as it is the firm, not the individual, that's registered. Engineers are listed by the GSR. By comparison, the Law Society requires solicitors and firms they work for to be registered yet solicitors cannot kill directly through negligence whereas gas engineers sadly can.

We also ask HSE to participate in the review of RGE training.

As far as we know our written requests to HSE on 13th December have yet to be answered as of 21st January 2019.

Air Quality Issues and Clean Air Bills
There are now two clean air bills in Parliament and Jim Lambeth, a CO-Gas Safety director & solid fuel expert, has kindly written an article about this topic on page 36.

House of Lords debate on Carbon Monoxide
We were absolutely delighted to know Lord Hunt of Kings Heath, our patron, secured the opportunity for a debate on CO in December- See https://hansard.parliament.uk/Lords/2018-12-17/debates/FB0CE962-2730-47BD-BD35-BC36D60BED9A/HomesGasSafety We were particularly glad he questioned GSR's policy 8.2 and how surprising it was that the landlord had to give permission before appliances could be tested for CO, regardless of the tenant's safety. He also asked the Minister responsible, Baroness Stedman-Scott, to confirm that the gas emergency service still does not carry or use equipment to test gas appliances for CO and, if so, why and what would be done about it. We are most grateful to him and to the other Lords and Baronesses who all made good points.

Technology
While people are still dying and being injured (see our case studies on pages 9 – 24), there is room for improvement. Technology does improve safety and the charity is very optimistic about the future and what is now available, (see page 32 on the Soter cut-off switch and page 34 about the Flueshoe). However, there is still no properly funded body to do what this charity does; nor are technological solutions being independently assessed and their investigation properly funded.

The CO Awareness Competition
http://www.energynetworks.org/gas/she/co-safety-competition.html
We enjoyed an amazingly successfully summer prizegiving at the Houses of Parliament, where the GDNs excelled themselves. Safety Seymour is a huge success thanks to Emmi Isham and I recently watched her in action at a school. The pupils were all lovely but were a very energetic group of boys and girls, so she had to work her socks off. See more about Safety Seymour on page 56, and the prizegiving on the inside back cover.

2020
Next year CO-Gas Safety, if still around, will celebrate its 25th anniversary!

I find it difficult to believe there is still no other body that collects, collates and publishes data of deaths and injuries from unintentional CO poisoning from all fuels, lobbies for change to improve safety nor offers victim support. Alzheimer's and dementia are terrifying and huge funds are being used to find a cure. Unsurprising to us, it seems being poisoned by CO increases the chances of being afflicted by dementia (see page 38), so why not spend a small amount of funds to prevent people being poisoned by CO?
I also find it hard to believe, despite a very wealthy energy supply industry, as well as two charities well funded by industry and much awareness of the importance of clean air, that independent, registered charity CO-Gas Safety still has no guaranteed funding.
We wouldn't survive without the generosity of Kane International Ltd.
We also could not do what we do without the enormous support and help of our unpaid directors & trustees and many others, particularly the courageous survivors and victims of CO poisoning who help us to learn why these problems occur and how they could be solved.
Death & injury from CO poisoning is completely avoidable if only industry & regulators would listen and learn from our victims.

Stephanie Trotter, OBE, President & Director CO-Gas Safety

THE GUILD OF MASTER CHIMNEY SWEEPS

Powering chimney sweeping into the 21st Century

www.guildofmasterchimneysweeps.co.uk

Carbon Monoxide Protocol for chimney sweeps

https://www.guildofmasterchimneysweeps.co.uk/carbon-monoxide-protocol-actions-and-guidelines-for-sweeps/

As a Solid Fuel industry leader, the Guild of Master Chimney Sweeps recognised there was no protocol for what a sweep should do if they are advised of or if they suspect a Carbon Monoxide (CO) incident. Very importantly, there was no protocol for what a sweep should not do. With this in mind, the Guild has produced the following CO protocol and advice.

Sweeps – you will often ask a customer if there have been any problems with their appliance. During casual conversation, you may be told that someone has been unwell in some way, or perhaps been to the doctors. Perhaps the reasons are unexplained and symptoms are unresolved. It may be reported that a CO alarm has gone off but the reason was not identified and no investigation undertaken. You may be told that someone has been exposed and this has been medically identified but it's still possible that you are the first person to look at the appliance. Or for some other reason you may simply suspect that someone has been exposed to CO.

In any event, if you suspect a CO incident then you must have a system in place for dealing with this and making your decision to sweep the flue or to preserve the evidence and report the incident.

Protocol actions and guidelines.

If on initial inspection the sweep believes that something to do with the installation may have been a contributory factor then advice should be sought because the issue may be investigated by Trading Standards rather than the HSE.

The sweep must gather some information before they undertake the sweeping operation to enable them to make a decision on what to do next and what advice to give.

The following should be ascertained before sweeping any flue following a CO incident or if you suspect a CO incident.

a) Is it possible that anyone has been injured by CO poisoning.

b) Is the property owner occupied or rented.

c) When was the installation carried out.

d) Has there been any significant changes to the installation, the room (such as new windows etc.) or the property as a whole (such as new kitchen with extractor fan

etc.) or to the chimney or flue (such as cowl, terminal or liner).

e) If the answer to d) is yes then you need to know what these changes are and when they were done and if the stove has been used regularly since then.

f) If anyone else has been to work on the stove or chimney recently and if so, how long ago and who. If the answers to the above suggest that there may be a professional who has carried out work on the installation in the recent months (less than 6 months) then the following additional will be information required.

g) The date and time of the incident.

h) Was there a CO alarm present and did this activate. If an alarm is present, make a note of its location and ask where the alarm was located when the occurrence happened. Record the make and model, photos are a good addition to written records. It might be that the alarm should be tested, so make sure this is preserved.

i) Who was affected, to what extent and if medical help was required or have those affected been to a doctor? Please note that a negative test on a survivor for CO does not necessarily mean the survivor was not poisoned because tests tend to be after the survivor has been in the fresh air.

Actions

If the answers to the above give rise to ongoing concerns, then the sweep should take action and avoid sweeping the chimney or disturbing the evidence by removing a baffle or cleaning access. If in doubt, don't touch it, delay sweeping, take photos and notes and leave all the appropriate warning labels and notices to make sure nobody uses the installation. Either make a report under RIDDOR or seek advice on the next step from a suitable organisation – listed below.

HSE – Form for reporting a dangerous incident:
https://extranet.hse.gov.uk/lfserver/external/F2508DOE

Guild of Master Chimney Sweeps – info@guildofmasterchimneysweeps.co.uk or call 01226 242357. www.guildofmasterchimneysweeps.co.uk

CO-Gas Safety Society - Email Stephanie Trotter, OBE office@co-gassafety.co.uk Tel. 01983 564 165 or 01483 561633 or 07803 088688 www.co-gassafety.co.uk

If the sweep is advised or decides that the incident could not be investigated for a prosecution then they are free to sweep the chimney and provide all the correct advice to the customer to help prevent a repeat of the incident. However, someone who has been badly poisoned by CO may need to consider his or her options (e.g. to prove poisoning for medical treatment or a civil legal action) before evidence is changed.

On all occasions the CO Alarm must be checked and if it is incorrectly sited then advice should be given on where it should be placed.

Case studies

Background about carbon monoxide, its impact on the population and cost by Stephanie

For the facts about carbon monoxide (CO) see leaflet pages 28 – 31 and http://www.co-gassafety.co.uk/about-co/carbon-monoxide-poisoning/

It is worth considering how many people die or are injured in the UK every year from unintentional CO* and civil servants always require a cost benefit analysis in order to justify any action. We think the official figures are a gross underestimate due to the fact that there is no automatic testing of CO on death, despite a recommendation from the All Party Parliamentary Carbon Monoxide Group, APPCOG to do this. However, even the accepted numbers mean that 'preventing carbon monoxide poisoning could save the UK £178 million a year; as well as avoid immeasurable human tragedy and suffering.'*http://www.publications.parliament.uk/pa/cm201314/cmselect/cmcomloc/50/50iii132.htm It is also worth noting that 3,500 people between the ages of 16 and 64 (by our data probably the least likely to die of CO) die of unexplained causes every year. According to Dr Mary Shepherd, who receives the hearts, there is no test undertaken for CO but in her opinion, there should be https://www.newscientist.com/article/mg18424765-600-the-killer-with-no-name/

The research undertaken by UCL and also by John Moore's university extrapolated over the UK leads **CO-Gas Safety to the conclusion that 3-4 million people could be being poisoned by CO+** (i.e. carbon monoxide and other products of combustion). http://www.co-gassafety.co.uk/about-co/numbers-affected-by-co/

Case Studies – we are very grateful to those who have agreed to allow their cases to be used
These case studies are in date order starting at the newest. We have two gas related CO studies, two petrol, two diesel and one solid fuel. Some are fatalities and some, thankfully are not. The fatalities are obviously tragic but so are the cases of long exposure. People may look fine; they may even appear to be fit and well. However this can be deceiving and most of them have long term chronic problems that cause them day to day pain and exhaustion and endless stress to their families. The account at the end of the case studies on pages 24 & 25 is very poignant. This lady powerfully expresses what it feels like to be poisoned. What has been overwhelming in 2018 is the number of people who seem to have no medical help and not even any sympathy for their plight.

There are three recent horrendous cases of badly installed solid fuel appliances that I know of, one in Scotland that has been dragging on for years with severe injuries to the person exposed, one in N. Ireland where sadly no win, no fee does not exist (and tragically it seems there is no way forward) although we are trying and a new one in England, which is more hopeful in the sense that some good lawyers are taking it on, fingers crossed. Even so this case will no doubt take years and compensation is only better than nothing. Naturally we can't write up such cases unless and until they are resolved.
Surely it would be far better to stop these appallingly bad installations in the first place?

My admiration for the efforts of those poisoned in helping us to inform and hopefully prevent others going through the same pain and suffering, is endless. I just wish those sitting at the top of the fuel industry and those in Government were a tenth as generous and courageous. Our function in offering victim support is to recommend good expert investigators and solicitors and there are sadly all too few of them. However, we seem to be the only body to do this while also collecting, collating and publishing data of unintentional CO deaths and injuries from ALL fuels.

To us the main point of collecting the data is to find out why the injury or death happened and how to prevent similar deaths & injuries in the future. A few things we have managed to do ourselves but most require action from industry and/or Government.

Please persuade anyone, particularly those in a position of power or influence in the industry or government, to read these incidents and take a moment to consider what might stop these tragedies happening and how you might help to accomplish this. Thank you.

Ken Jeffery 2017 - petrol – boat

Ken Jeffery and Samba

https://www.bailiwickexpress.com/jsy/news/family-man-who-died-boat-warns-dangers-carbon-monoxide/#.W0WxMrgnbIU

My husband Ken Jeffery was found collapsed on board his boat on the 16th February 2017. Paramedics were unable to resuscitate him. An inquest found that he died from carbon monoxide poisoning. There was 68% carbon monoxide in his blood.

He had been starting the engines of the boat under the canopy in the cockpit. The engine was powered by petrol. The fumes or products of combustion were being funnelled back into the cockpit from the exhaust outside the boat. Tests carried out found the canopy filled up with carbon monoxide in a matter of minutes.

Ken was an extremely experienced sailor, first learning to handle a dinghy when he was about seven years old. He was a former ship's pilot in Jersey which is well known for its dangerous coast. He was in the merchant navy, graduating to first officer. He spent several years on huge cargo ships going all over the world. He owned a boat of some sort all his adult life. He was a very careful man who seldom took risks. He believed in belt and braces. He would never knowingly put his life or the lives of others in danger. Yet in spite of this, he died in a devastating accident which could so easily have been avoided.

Mr. Lee Battrick, marine surveyor and consultant, who completed an accident report on Ken's death said there are a number of things individuals can do to reduce the risk of being poisoned. Alarms should be fitted on boats as they pick up the slightest amount of carbon monoxide in the air. However, on boats, they need to be special marine alarms. He said maintenance is also extremely important. Boat owners should regularly check their engines, exhausts and anything else which is in a confined space that can give off the gas. People should also be cautious about going straight into a space where they see someone unconscious because the level of gas may still be high.

Mr Battrick has since distributed safety leaflets to the marine office, island chandlers, engineers and boatyards providing information on protection from the deadly gas. To view this leaflet go to www.boatsafetyscheme.org and search 'carbon monoxide'.

Ken was a wonderful, devoted husband and father who was adored and respected in return, not least by his faithful canine companion Samba. Ken was brave, tenacious and patient - he never gave up. He

suffered several tragedies. He fought, and won, personal battles in his life. He constantly strove to be a better person and always tried to put other people's needs before his own. As someone remarked at his funeral, 'he was a gentleman and a gentle man'.

I have lost my soulmate and my best friend. His daughter has lost her beloved father. We just hope that by publicising the cause of his death we may help others to avoid the same fate.

Kind regards,

Margaret Ann Jeffery 07.02.18

Please see the film of Margaret telling us about what happened to her husband Ken
http://www.co-gassafety.co.uk/please-watch-this-clip-of-brave-margaret-jeffery-who-lost-her-husband-ken-to-co-in-a-boat/

Written by the wife of a man badly poisoned by carbon monoxide in 2017 – diesel

I would like to tell you a story. First of all, imagine a 6' 2" Texan (and a British citizen). Born and brought up in Japan for 40 years, apart from the times he was attending University in the USA. He has an extremely high IQ. A star baseball and basketball player. He is the son of an American Baptist Minister and his wife who went to Japan after events at Hiroshima.

He exuded the best of both cultures (These children are known as third culture children). The patience and tranquillity of Japan. Listening and giving serious thought before responding. He had great respect for others. Proud of being an American and the state of Texas (The Lone Star State). Outgoing, enjoyed socialising with people, with no fears. A dignified man.

So here was a man who was outgoing, fearless, always listened, always considered what was said and responded appropriately. Who was patient and kind. A man who had the most amazing memory. A proud man. A dignified man. Who was in excellent health both physically and psychologically. He loved driving, both in Europe and the UK.

All of that changed on January 20th 2017 when T suffered a severe brain injury due to carbon monoxide poisoning. Now imagine a man who has persistent headaches and debilitating vertigo. He had locked fascia joints which means he is in excruciating pain all of the time (it never goes away) from the base of his skull radiating down to the middle of his back. There is no analgesia that is effective. Degradation of the vision in the right eye and deteriorating hearing in the right ear. Tremors in his right arm. Word finding is becoming an ever-increasing issue. His short term memory is affected to the point that it not possible to remember what was eaten for breakfast. PTSD. Dislike of being in busy, crowded places. Severe anxiety. Impatient, short tempered. Quick to anger. Often detached. Urinary incontinence which means that wearing diapers is a necessity. Can you imagine how dreadful that is? Bowel issues. And finally, a diagnosis of functional ataxia. This leads to a fear of going out alone due to the likelihood of falling due to an unsteady gait and dizziness. He now uses a walking stick and cannot go out alone.

I understood that most people who suffer exposure to carbon monoxide poisoning die. We all too frequently hear of adults and children dying due to faulty boilers or have unknown problems with their cars. And of course, those people who choose to take their own life. What we do not hear so much about is that those who don't die can suffer permanent brain damage.

Within a short time carbon monoxide poisoning was diagnosed as being the cause of the first flu like symptoms, headache, shivering, nausea and vomiting and extreme tiredness. The devastating symptoms of delayed neurological sequalae started to present some weeks later. After the van was checked it was found that the flexipipe was blown. This led to carbon monoxide seeping into the cab. The reality is, that he was probably minutes away from death. Medical experts have no doubt at all that all of the symptoms he has are a direct result of carbon monoxide poisoning on January 20th 2017.

People often ask "Why did you stay in the van?" A silly question really, nobody would subject themselves to potential death. But carbon monoxide is invisible and odourless. And how would anyone expect a vehicle to have such a potentially fatal defect?

This was the start of a devastating life change for T primarily, but also for myself and by default our whole family. Our whole life changed irreversibly. All our plans for retirement no longer possible. He had to surrender his driving licence. This was a massive blow - he had been driving since he was 16. It seems unlikely that we will be able to see children and grandchildren in the U.S. The journey would be too much and the travel insurance prohibitive. The same applies to Japan where T's 91 year old father still lives As well as children and a grandchild there.

Not just one life irretrievably changed for ever but also that of family living in various parts of the world. Can you imagine how heart breaking that is? The worry and anxiety about how we are to manage only exacerbates T's condition.

A neuro psychologist we saw at the National Hospital in London some weeks ago said something that defined this whole thing. " You are broken ". Such a simple sentence but so incredibly true. He is irreparably broken.

T has had every possible test and medical examination to evidence he had no pre-existing medical conditions. He has had multiple blood tests ranging from tests for syphilis, copper poisoning to the usual tests for anaemia etc. He has had bladder ultrasound, tests for Parkinson's, nerve conduction studies to name but a few. They all support the fact that he was a fit and well man up until January 2017.

We have seen the worst and best of the NHS. The medical profession generally have none to very little knowledge of the neurological devastation caused by carbon monoxide poisoning, nor how to treat it. Without going into detail we found our own medical support by researching and discovering the best people to go to. They were at St George's Hospital and The National Hospital for Neurology. Both in London and with Specialist Units. T emailed both and they were happy to see him, once our GP referred him. We have been lucky in having such a supportive GP. He had no experience or real knowledge of Carbon Monoxide poisoning. He does now😊! And has been there for T every step of the way.

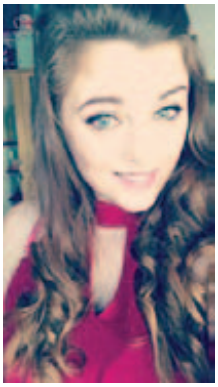
T has PTSD. He has been assessed at the higher end of the spectrum and will be having counselling as recommended by the neuro psychologist he saw in London. A professor of neurology diagnosed pan neurological progressive deterioration due to carbon monoxide poisoning. This is incurable and irreversible with each new symptom being treated as it arises. This was a terrible and brutal blow. Hope of some improvement in the future being taken away.

We also applied for Personal Independent Payment (PIPs). The assessor had never come across anyone suffering the consequences of carbon monoxide poisoning. In some areas T may not have fitted the correct tick boxes. But the assessor had to be able to step back and look at the bigger picture. All of the supporting documents were invaluable. T was awarded the higher rate of PIPs. And so we go on. Nothing is easy and breaking through the barriers and lack of knowledge in not only the medical profession but many other areas is wearying to say the least. We always remember what Headway have said. T is a brain injury survivor. He is also a carbon monoxide survivor and his scars are the huge neurological damage that has been done and will never improve.

I read recently, "Carbon Monoxide causes brain injury. It is not only an "invisible killer", it is also one of the main culprits in causing an "invisible injury". That is, long term brain injury that alters how a human being thinks, feels, behaves and moves."

There really isn't anything else to say.

Death of Nikki Willis and Thomas Putt – 5th December 2016 - petrol



https://www.facebook.com/bbcnewseast/videos/1244028165652628/

My name is Michelle Hindson and Nikki Willis was my daughter. She was 23, and although every parent is biased, she was beautiful. Nikki had recently changed jobs having worked with me for 5 years since leaving college where she had studied Sport.

Nikki was working on Sunday the 4th December. My husband and I had spent the day wrapping and labelling Christmas presents and had placed them under the tree. I had made dinner expecting Nikki to be home after work, but she sent me a text to say she was meeting a friend and would eat later. That was the last contact I ever had from Nikki.

The incident unfolded as follows –

On the morning of the 5th of December 2016 a car was seen outside my house with its lights on and engine running by my son when he went to work at 5.45 a.m., by myself at 7.30 a.m. when I went to work and by my husband when he went to a doctor's appointment at 9.30 a.m. None of us gave this car a second thought due to some visitors who frequently attended a nearby property.

My husband returned home at 10.30 a.m. while both my son and I were still at work. Shortly after my husband got back a mass of emergency vehicles began filling up the area outside my home. A Police officer called at the house advising my husband that 2 people had been found dead in a vehicle and to stay indoors, due to a suspected chemical incident. My husband then went to check on my daughter to tell her to stay indoors as she had asthma, only to find she wasn't home. My husband called me at work to see if I had had any contact with Nikki, which I had not. I then called my son, her place of work, a couple of her friends and her boyfriend. Panic began to set in as we could not find Nikki, no one had seen or heard from Nikki since the previous day.

Whilst I was at work and trying frantically to contact any of Nikki's friends, a connection was made that another of Nikki's friends, Tom Putt aged 20, could also not be contacted and that also no one had seen his car, a Blue Fiesta. Suddenly the penny dropped, followed by a police car arriving at my work with my husband. My daughter had been found dead in a car right outside my home.

The Police were initially unaware of how this incident had occurred. This meant we were not allowed back to our home while they carried out investigations. I was not allowed to have anything of comfort from my daughter's room, nor were we allowed to see Nikki until they had completed the investigation. It was the 8th December before we could see Nikki and go home.

Post Mortem findings concluded Carbon Monoxide Poisoning, with no indication that this was done on purpose, (i.e. suicide or murder). Therefore, the vehicle was kept for further testing.

During the next 3 months we eventually had Nikki's belongings returned, her handbag, clothes, laptop and phone, as we prepared for a coroner's inquest.

Inquest

21st March 2017 we attended the coroner's court, where the coroner ruled Nikki's death as an accident. Mobile phone reports showed that Nikki and her friend were in the area from 10.00 p.m. on the 4th of December, but they were unable to determine a time of death.

A video was shown in court of the investigations carried out by Essex Police, along with the help of Ford. Ford supplied an identical car to the one Nikki was in and Essex Police conducted tests using smoke to make the findings visible. They also replicated the conditions of the night Nikki and her friend died.

The video showed that the catalytic converter had been removed and replaced with a 'straight pipe' (also known as a 'decat' pipe) this was done with the intention of enhancing performance of the car, it also showed that a bolt was missing and this meant the dangerous fumes were leaking into the engine bay (the area under the bonnet).

Vents had also been installed into the bonnet of the car and the matting normally found under a bonnet had also been removed.

As it was a cold night, Nikki and her friend had been sitting in the car having a chat, with the engine running and the heater on (Nikki hated the cold), this in turn was sucking the fumes from the engine bay straight back in to the car through the heater. Nikki's blood showed over 75% carbon monoxide in her system.

The test carried out using smoke to reconstruct the incident revealed the vehicle was now emitting 1000 times more carbon monoxide parts per million (ppm) than would have been legal to pass an MOT. (A legal amount is 0.2%) and in fact the testing had to be stopped because it became too dangerous for those carrying out the reconstruction. This was the information read out to the coroner by Essex Police, CID, DI Rob Kirby, all of which was documented and released by the press https://www.facebook.com/EssexPoliceUK/videos/1310111392406091/

What we have learnt

What we have learnt is that people can think they know what they are doing with their vehicles, but sadly many don't and are not qualified to carry out such work. We have also found that support following such an incident is very hard to gain access to.

The vehicle was only 2 years old so would not have been required to have an MOT for another year, and had the conditions of that night been replicated in a traffic jam, following cars and occupants could have also been affected.

What needs to change

Awareness
In our opinion there needs to be much better awareness of the dangers of modifications to cars and how these increase the risk of carbon monoxide poisoning.

The existing law needs to be enforced
Secondly, as stated in the information sheet, many modifications are breaking the law, for example if a catalytic converter was originally fitted at the point of manufacture, then the removal of this is breaking the law. Therefore, the law needs to be enforced.

A mobile carbon monoxide detector was used in the investigation so why can these not be made more available to the Police to remove potentially dangerous vehicles from the road? It clearly states on the Gov.uk website 'that emissions may also be checked as part of a roadside check', yet one Traffic Officer I spoke too did not even know this piece of equipment was available.

I made contact with my MP (Simon Burns MP for Chelmsford, prior to his retirement, and Vicky Ford, MP for Chelmsford, his successor), who both took my concerns and questions to the Secretary for transport, Chris Grayling MP, because clearly something needed to change. 12 months down the line, an information sheet has been published on the Gov.uk website. Please see https://www.gov.uk/government/publications/modifying-your-vehicles-emissions/modifying-your-vehicles-emissions-the-legal-safety-and-health-implications This was published on 2nd February 2018.

A recommendation was made by the coroner that initially Ford UK and Essex Police work with the families to raise this issue, However, to date we have not heard anything.

Kimberley Jones 2013 – solid fuel - house

Kimberley Jones, 25, care worker needed somewhere to live with her baby son. Kimberley's father, Andrew found a house nearby which he bought for Kimberley to use as a home for her and her son. Andrew bought this from a family friend of some 25 years standing.

Andrew went in to the house in early August 2013 and did some decorating. He slept over in the house to keep it secure. On the 8th August Andrew woke up cold and lit a fire in the multi-fuel burner. Kimberley was due to move in on the 10th but was allowed to move in on the evening of the 8th. As the house was still quite bare and empty, Kimberley left her son Ieuan with her mother Helen for the night.

Andrew told Kimberley to keep a window open as he didn't want her to die of carbon monoxide. He said that this will haunt him to the end of his days.

Mr Jones said his wife called him the following morning which was the 9th as she could not contact their daughter. Kimberley's body was found by a paramedic at the house in Cwmbach, Aberdare on 9th August 2013.

Gas expert inspector Howard Reed told the coroner the fire was dirty with a lot of soot and debris.

Tests showed its window and door leaked smoke and carbon monoxide tests found that after two hours there were 829 parts per million (ppm) of the gas in the room.

A domestic carbon monoxide alarm would sound at about 50 ppm and levels of between 600 and 750ppm are likely to cause fatalities, the hearing was told.

Helen and Andrew, Kimberley's parents are bringing up Ieuan.

CO-Gas Safety is incredibly grateful to the family and particularly to Jessica Jones, Kimberley's sister, who organised a sponsored walk up Pen-y-fan in 2014 to raise money for CO-Gas Safety.

We are also extremely grateful to Mark Aylett, a member of the Guild of Master Chimney Sweeps, who very kindly dressed up in his sweep's gear (complete with chimney brush) and encouraged Stephanie all the way up to the summit. Without his help she would never have made it.

Rebecca Scarlett Poisoning 2014 - Gas

Edinburgh

One morning, in October 2014, I woke up with the most excruciating headache I'd ever had and felt extremely drowsy – much more so than normal for a weekday morning. It was different from just feeling tired after waking up, my body felt like it was shutting down. When I got out of bed to take a shower, my legs gave out from under me and I collapsed.

From then on in, I suffered a series of unexplained symptoms over a period of three months – from piercing headaches, muscle weakness, collapsing and electric shock type pains all over my body, to vomiting, losing consciousness and even incontinence. It was absolutely terrifying, but no one could tell me what was wrong with me. I had MRI scans, blood tests, even a lumbar puncture. The GP hypothesised that I was suffering from migraines, and that when I collapsed that first time, it had turned on and amplified all my nerve pain receptors. On one hospital visit after another episode, the nurse seemed surprised after I breathed into some equipment. She asked if I was a smoker or had COPD, as my oxygen levels were very low. I said no, so she waited a bit and did the test again, and this time my oxygen levels came back normal. She was satisfied with that. That was probably one of the key times a medical professional had the opportunity to spot what was really wrong with me, but again, it was missed. I found out later that there were further indications in my blood tests that I had been exposed to CO but again, no link was made.

Finally, on Christmas Eve, a few days after another episode, I decided to call a Gas Safety Engineer out to my flat. I did this, because every time my sister was in my flat, she said she could smell gas, and told me I really needed to check it out. I ignored her the first few times, because I had an old boiler, and sometimes it played up a bit and gas could be smelled in the air from time to time. It didn't strike me for a second that it could be the origin of my illness. But as soon as the gas safety engineer walked into my flat, his Carbon Monoxide alarm started to go off. He said there were moderate levels of CO in the air, and when I told him about my illness, he suggested there was a good chance I was suffering from Carbon Monoxide poisoning. I was in disbelief. I didn't even know it was possible to survive after breathing CO, I just thought it was an immediate killer. He condemned my boiler then and there.

My boiler was 20 years old at the time and I owned the flat, so it was my responsibility. I had smelled gas 18 months previously and called a gas engineer out then, he checked it over but couldn't find anything wrong with it, he said there was a hole in the roof and that when it was really windy, it was probably just blowing the gas light out with a backlash of gas, causing the smell. Perhaps something was missed then, I don't know, but I just didn't realise the importance of having annual gas safety checks and boiler servicing. I'd lived there for 10 years, it was the first flat I'd owned, and I'm ashamed to say I'd never had my boiler serviced, even though it used to cut out all the time.

After the boiler was condemned, all my symptoms just stopped – it was miraculous. No more sudden collapses, or being shocked in my toes or excruciating headaches.

But three years later, my life had changed dramatically. I had started suffering from a multitude of mental health problems that were getting worse and worse over time. I felt like my personality had completely changed, I was anxious all the time and felt unable to cope with anything that life threw at me, unable to do my job, stressed, emotionally unstable and latterly, very nihilistic. I wasn't suicidal, but I was struggling to see the point in anything. I put it all down to life circumstances at first as things started to get out of control earlier last year, after a close friend of mine committed suicide. But eventually I realised this went way beyond my friend's death, it had been building up ever since I was exposed to Carbon Monoxide.

I continued to struggle to get support from medical professionals, one Community Psychiatric Nurse told me to 'take up a hobby' and advised I couldn't access any NHS psychological services as my condition wasn't severe enough. She'd spent 10 minutes with me. Eventually I went in search of my own answers and carried out extensive in depth research into the long terms effects of Carbon Monoxide. I found growing evidence to suggest long term exposure can cause brain damage, manifesting as anxiety, depression, personality changes, mood disorders, cognitive impairment. It all made sense to me, but I didn't know how to broach it with my GP, so I searched for a charity that supports victims of CO poisoning, and eventually I found CO-Gas Safety (but it wasn't easy to find and I wish someone had signposted me there earlier). Stephanie replied to me immediately, was extremely empathetic, but explained she specialised in law and was not a medic, so would pass my email on (with my permission) to a fellow victim, who may be able to offer me some support and advice based on her own experience.

A few weeks later, Belinda called me. She had also been exposed to CO 5 years earlier and when I told her my story, she said it completely mirrored hers, and she was convinced I was suffering from the effects of CO poisoning. She was empathetic, reassuring and gave me a lot of emotional support. She also gave me a lot of practical advice though, sending me links to reports and research and giving me instructions for engaging with the GP. She explained to me that she had found something that had really helped her – an antidote to CO poisoning – B12 injections. She told me that B12 is commonly used to treat cyanide poisoning as it's a powerful toxin scavenger, but there was emerging evidence over its use for CO poisoning as well. Belinda empowered me to engage with the GP and I managed to convince her to take me seriously and agree to further investigation. She agreed to read the research I'd found and to send it on to the neurology department to request a referral. She also agreed to test my B12 levels as it was as simple blood test. Amazingly, I got a call three days later to be informed I was indeed deficient in B12. I started injections straight away and will now have them every three months for life.

Four weeks after the injections started, I feel like a different person. I feel like a heavy cloak has been lifted from me, like I can breathe properly for the first time in years. I feel capable, and resilient and ready to cope with life. The change in me has been nothing short of amazing.

If it wasn't for my own proactivity and research, and the help and support of CO-Gas Safety and Belinda, I may never have found out that there was a link between CO poisoning and mental health issues – or of course with B12.

There is clearly still so much work to be done around awareness raising, both with the public on gas safety and with the medical profession around diagnosing CO poisoning and treating the long terms effects of it. Most doctors just presume if CO doesn't kill you or cause immediate obvious damage, it will just leave your blood stream and that's the end of it. On reflection, I was breathing in CO for two winters in a row as I had milder but similar symptoms a year before I started to become very ill, I just never made the link. It's scary to think how many people might be out there slowly getting poisoned from breathing in CO, without anyone ever picking up on it.

Pauline Croxall Date of death 2012 age 72
Diesel powered generator

Taken down by Stephanie Trotter on 13.12.18 from her sister Karen Barlow

Pauline lived in a 50 foot by 10 foot caravan/mobile home. This was in a large field. Pauline wanted to stay there with her cattle who were calving She added a large porch on the side. She could only walk with sticks but got help from her grandson when she needed it for the cattle.

She had a big diesel powered generator outside for electricity. She had been told it would cost £30,000 to put the mains electric into her caravan.

The generator broke down and the estimate was £2,500 to repair it. Pauline therefore bought a small generator (also diesel) which she put in the porch. This ran for four hours before she had to top it up.

She also had a new multi-fuel fire put in her lounge a couple of months before she died. The people who installed the fire left a CO alarm from British Gas Honeywell. This used to go off when the little generator was on. When she had the little generator on in the porch, she left the back door of the porch open so the fumes could escape.

Her sister Karen use to take Pauline shopping on a Saturday but often Pauline wasn't well enough to go. On the occasions when she just had to go shopping, she would often feel much better after about ten minutes in the car. Karen kept telling Pauline that she thought it was the generator making Pauline ill, but Pauline refused to take any notice although the CO alarm kept going off. Pauline thought the alarm was faulty because the alarm had come with the fire, so she never thought that the alarm was sounding because the generator was emitting CO.

Pauline got so fed up with the alarm going off that she put it on the dustbin outside. However, it was quite near the little generator so would carry on alarming. Karen knew nothing about this. Eventually Pauline put the alarm in her bedroom under a pillow where it was well away from the generator and so stopped making a sound.

Pauline just didn't know enough about carbon monoxide to realise that the alarm should be taken notice of. Karen didn't know that the CO alarm had been sounding but that Pauline had ignored it. Pauline's nephew knew that the CO alarm had been sounding but didn't realise the significance. If only Pauline or her nephew had known how quickly CO can kill, then Pauline would still be alive.

When it was really cold Pauline slept in the lounge. She had sealed off all the air vents. That is where Pauline was found dead. The investigator found it was the little generator that had poisoned her, not the fire.

After her death one of the family members found someone willing to mend the big generator outside for only £25.

Katie Overton aged 11 died from CO in 2003- Gas.
The impact on the family by her younger sister Sian.

Picture shows from left to right, Emma, Sian and Katie

Note from Stephanie – In our press pack 2018 we featured Katie's story told by her father, Paul Overton, who has been a trustee and director of CO-Gas Safety since 2005.
This year her sister Sian wanted to provide us with the impact Katie's death had on her and her family as well as support our call for changes to the Gas Regulations. We are very grateful to Sian Overton.

When I was 7 years old, my sister Katie died of carbon monoxide (CO) poisoning at 11 years old. Katie was a kind, bubbly and caring girl, who had her life snatched away from her.

Katie was killed during the night by carbon monoxide poisoning because our boiler was not serviced regularly and the carbon monoxide leaked into her room. I remember playing with my toys under my bed and hearing my dad shout "CALL 999". I then went downstairs and then the paramedics took Katie down the stairs on a stretcher. Then I went into Katie's room and saw blood on her bed. The next time I saw her she was in a white coffin at the morgue.

When I was 7, I had many nightmares after Katie's death and thought I was going to die. Then when I grew older I suffered with OCD, anxiety and depression, at one point I had suicidal thoughts. I have problems with my long term and short term memory because of being poisoned by carbon monoxide. Katie's death has had a big impact on our family. We miss Katie every single day and life does not feel complete without her. We are not the same happy family as we used to be because Katie is missing. We have all suffered after Katie's death in many ways, especially with grief.

Before Katie's death we didn't know anything about CO; we didn't even know it existed.

Katie's death could have been avoided if an audible carbon monoxide alarm had been fitted.
https://www.google.com/amp/s/www.thesun.co.uk/news/7301498/gas-safety-week-parents-tragic-girl/amp/

The current law is that landlords only need to install a carbon monoxide alarm if the house has an appliance that burns solid fuel such as coal, wood and charcoal. Landlords do not have to install a carbon monoxide alarm if the appliances burn fuel such as gas, paraffin, oil and LPG even though any of these can emit carbon monoxide.

If you are in an adjoining property or block of flats, you could still get carbon monoxide poisoning even if you do not burn any fuel because carbon monoxide can seep through the brickwork or perhaps through a joint chimney or attic.

It is worth bearing in mind that less than 2% of CO in the air can kill in between one and three minutes. see Para 74 table 23 page 26
http://www.hse.gov.uk/foi/internalops/hid_circs/technical_osd/spc_tech_osd_30/spctecosd30.pdf

If the gas boiler had been serviced regularly this would have prevented Katie's death. Landlords are required by law to keep the gas appliances they own in a safe condition. Landlords are also required by law to arrange for a gas safety check and certificate every year. The problem is that landlords can be confused and think that a gas safety check and certificate is all that is needed, whereas obviously every few years a gas appliance needs a proper and full service. The service costs more than a simple check. It would surely be easier and safer if landlords were simply required to have their gas appliances either serviced or their emissions tested for carbon monoxide every year. Merely testing the emissions is often what British Gas does when it provides a service. If the emissions are within a safety range, there is no need to strip down the boiler and clean out any soot etc. Indeed, it is perhaps better not to if there is no need because even registered gas engineers have been known to fail to put the boiler parts back together correctly.

The investigation into Katie's death found that our boiler needed a very good clean and service. The registered gas installer wanted to service it but the landlord kept asking for a gas safety certificate. Sensibly, the registered gas installer refused to provide this certificate knowing a service was badly needed. Katie paid for this misunderstanding (or meanness on the part of the landlord) with her life. With the risk being so high it would surely be better to make sure everything is done to prevent CO emissions, as well as having the CO alarm just in case something unexpected happens (e.g. a bird's nest falls down a chimney or flue).

Stephanie Trotter has proposed this change in the law on landlords' gas safety checks, certificates and CO alarms. She has published an article about this in the New Law Journal 28.03.18 & Gi magazine, September 2018. CO-Gas Safety has support for this change from the Pimlico Plumbers, (Charlie Mullins), The Dominic Rodgers Trust, (Stacey Rodgers), The Katie Haines Memorial Trust,(Gordon & Avril Samuel) Holiday Travel Watch, (Frank Brehany, Consumer Champion) the National Landlords' Association, (Richard Price & Clive Norris) The Gas Industry Safety Group (Chris Bielby), the Gas Safety Trust (Chris Bielby), The All Party Parliamentary Carbon Monoxide Group (Dr Ben Klos) and IGEM (Ian McCluskey). So why hasn't the government agreed to these sensible changes?

The symptoms of carbon monoxide poisoning are:-
headaches
dizziness
nausea
breathlessness
collapsing
loss of consciousness.

Also, if your pet is ill or wants to go out a lot, there could be a low level of CO in your house.

I am sharing this in order to raise awareness, because people are still dying and suffering permanent injury from carbon monoxide poisoning. Hopefully by sharing this I will help to save at least one life.

CO alarms need to be audible and comply with EN 50291. It is also wise to buy them direct from a reputable supplier and not from the Internet. See http://www.co-gassafety.co.uk/about-co/alarms/
For further information about carbon monoxide go to: http://www.co-gassafety.co.uk

A video version of this account will be put on the CO-Gas Safety website in the late summer.

Sian Overton, Katie's younger sister.

Account received recently from someone who tells us she has been poisoned.
She can't prove in a court of law that she has been poisoned by carbon monoxide.
What matters is that this exactly expresses what it is like for those who have suffered from carbon monoxide.

I don't know how long I have had carbon monoxide poisoning.

I suspect two years.

I thought I had food poisoning, flu, worsening fibro myalgia, depression and eventually that it may be a brain tumour. I felt insane and insanely ill.

My son came home from university in May 2018.

He was horrified at my weight loss. He thought I was anorexic.

The neighbours thought I was on heroin.

My son saw me cook and eat. This isn't an eating disorder.

He was the one who said there is something seriously wrong with you mum.

We both began to behave strangely. Arguing, sitting in separate rooms, sick, dizzy, tearful.

A day in May I was attending an appointment. My son rang me. All alarms were going off.

I live in social housing. I had been told to ignore the alarm and stop complaining but that day I rang for help. I wasn't going to risk my son's health.

I was told again to stop complaining.

At my appointment I was pouring with sweat and ashen apparently.

I was advised to get to a and e.

I then received a second phone call from the engineer to say there was no evidence of carbon monoxide so I returned home.

My relationship with my son deteriorated rapidly. I was agitated all the time.

He said he did not recognise me any more.

I never told him I didn't recognise him any more either.

He left.

I started to lose my memory. To the extent that I was examined by a doctor and only knew the next morning when I saw a prescription on the table.

His conclusion was I was drunk and may have a uti*.

Apparently I passed out in front of him.

Unbelievably and painfully I have also been told that I attended hospital. I have no memory at all of this.

My dog became ill. A vet came to put him down. My dog Dylan was only 3.

I paid for him to go to hospital instead. I was told he'd been poisoned.

At this point I realised I was too.

A laughing stock by now at the hospital, addict, drunk, hypochondriac I was tested for carbon monoxide poisoning.

I needed oxygen. It was at fatal levels.

Throughout this experience I had been talking to my cousin daily.

After 6 weeks he told me that he didn't believe me. That carbon monoxide only kills quickly.

He didn't know about slow poisoning. I didn't know.

Why?

The only support I have had, and it has been immense, is from Stephanie Trotter OBE who solely runs a charity for victims of CO-Gas poisoning. She's unpaid.

How many have died this way, why don't the medical profession recognise it, and how many more have to die before the law is changed.

The silent killer needs to be shouted about.

*urinary tract infection.

Note The dog has recently died.
This person is a journalist and is living in a Housing Association property. We have communicated with the landlords. We are hugely indebted to her and her gift with words provides us with a unique way of understanding what it’s like to have been poisoned.

The Guild of Master Chimney Sweeps
Powering Chimney Sweeping into the 21st Century

WARNING
AFTER LOGS STORED INDOORS CATCH FIRE AT TWO HOMES

Posted December 14th, 2018 by Guild & filed under Do you have a chimney.

HOUSEHOLDERS have been warned not to store wood near hearths after logs caught fire inside a house near Watlington.

Oxfordshire Fire & Rescue Service sent fire engines to tackle the blaze from Wallingford, Thame and High Wycombe fire stations on Sunday evening, December 9.

Firefighters entered the house wearing breathing apparatus and found logs alight next to a wood burning stove. The fires were quickly put out and the logs moved safely to an outside spot.

A spokesman for the fire service said: “This could have been a more serious incident, so if you are lucky enough to have a wood burning stove please don’t store wood (or any other flammable item) near the hearth as it can get very hot and radiated heat can causes items to ignite.”

Unfortunately the incident is not isolated – Bradley Coles, who runs The Gentleman Sweep in Fernwood near Newark, had a shock when he arrived at a house to sweep a chimney for an older lady on December 7. He saw wood piled up near the fire stove [**pictured above**] and began to point out the dangers to the woman when he suddenly saw some logs – outside the appliance – were alight.

Bradley said: "I arrived at this house and halfway through giving a lecture about not stacking wood by the stove, I realised the pile of logs was actually burning. The elderly lady had no clue. It was a blooming lucky escape for her."

Bradley also said that in his opinion, it was five to six hours since the stove had last been refuelled with wood. This would suggest they had been smouldering away for most of this time.

Lawson Wight, chairman of the Guild of Master Chimney Sweeps, praised the quick-thinking and professional actions of the fire crews at the incident in Watlington. He also lauded Bradley, a member of the Guild, for potentially saving his customer's life.

"These incidents serve as a sober reminder that householders need ongoing education about safety in respect of fires at home. This is just the tip of the iceberg, as far as we are concerned.

"I would strongly urge people to read advice about safe fire use on the Find a Chimney Sweep website and contact their local Guild sweep, or fire service, should they have any questions."

Get safety tips on using your fire stove or open fire. Visit:
https://findachimneysweep.co.uk/safety/chimney-safety-tips/

Below are photos taken by Lawson Wight at a chimney sweeping appointment (unrelated to the above incidents). The customer had actually placed these logs on top of her stove to "dry them a little more" and scorching is clearly visible. "Householders need ongoing education about safety in respect of fires at home," said Lawson.

Avoid dying or being injured from carbon monoxide poisoning

Christi and Bobby Shepherd tragically died of carbon monoxide in 2006 in Corfu while on a Thomas Cook holiday.

What is carbon monoxide (CO)?

A deadly gas that can be emitted from faulty cooking and heating appliances powered by any carbon based fuel that burns.

Fuels include gas, coal, wood, petrol, diesel etc.

Can you identify potential sources of carbon monoxide in the picture above? For the answers go to http://www.co-gassafety.co.uk/answers/

CO-GAS SAFETY 24TH ANNIVERSARY PRESS PACK 1995-2019
Publication of 23 years of data of Deaths & Injuries from Unintentional Carbon Monoxide Poisoning 1995-2018

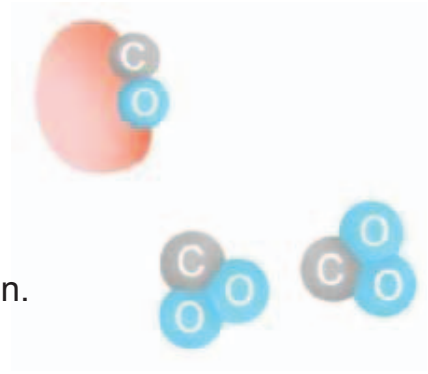
CO cannot be sensed using human senses of smell, taste, sight or touch.

Less than 2% of CO in the air can kill in between one and three minutes.
http://www.hse.gov.uk/foi/internalops/hid_circs/technical_osd/spc_tech_osd_30/spctecosd30.pdf
(Paragraph 74 table 23 page 26)

Firemen when talking about CO in smoke (which you can smell) say it takes only three breaths, the first you don't know there's a problem, the second you might suspect there's something wrong but by the third you are unable to take any action.

CO alone being emitted from cooking and heating appliances has no smell.

Why is CO so lethal?
Because it binds to the haemoglobin in the blood which normally carries oxygen so it suffocates.



What is the difference between CO and CO2?
CO2 consists of one atom of carbon and two of oxygen.

CO also contains one atom of carbon but only one atom of oxygen. CO is emitted when there is a lack of oxygen at the flame.

How do you prevent CO in your home?

1. Install all cooking and heating appliances correctly according to manufacturer's instructions using properly qualified people. With gas they must be Gas Safe Registered and qualified to work on your type of appliance.

2. Maintain your appliances regularly according to manufacturer's instructions using qualified people.

3. Have chimneys and flues swept and checked by a sweep belonging to a recognised trade organisation.

4. Ensure adequate ventilation. Don't block grilles which were put in to ventilate a fire etc.

5. As an extra safeguard (e.g.to protect against a bird's nest falling down the chimney) buy and fit a CO alarm to EN 50291 from a reputable supplier.

Low levels of CO over a long period can make people ill but GPs rarely diagnose this as CO.

Symptoms of low level poisoning include:-

HEADACHES DIZZINESS TIREDNESS BREATHLESSNESS NAUSEA

and generally feeling unwell similar to many viral illnesses.

Different members of the family can suffer different symptoms

Please make sure you're safe from CO and other products of combustion.

In an emergency please ring **0800 111 999 for the Gas Emergency Service** but please be aware they do not have the equipment to test gas appliances for carbon monoxide emissions.

If you need further information please visit **www.co-gassafety.co.uk**

CO-GAS SAFETY 24TH ANNIVERSARY PRESS PACK 1995-2019
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CO-Gas Safety is an independent registered charity run almost entirely by volunteers, offering free and confidential help and advice to victims and their families.

We are especially interested in helping those who have lost a loved one or who are suffering.
To get in touch please email **office@co-gassafety.co.uk**
You can also telephone or text Stephanie Trotter on 07803 088688. If she can't talk to you, please leave your name, number and email address and she will call you back. Stephanie will do her utmost to contact you and help, especially in emergencies & for anyone who has lost a loved one.

Stephanie will try to be accessible to help you at all times, but if she is not available you can contact a solicitor for free initial legal advice. Please see contact details which we will put up if necessary on our website at www.co-gassafety.co.uk

Account of the Corfu case by Stephanie Trotter OBE

Back in 2006 and before CO was announced as a cause of death of Christi and Bobby, I telephoned the hospital in Greece to suggest testing the dead children and, if the cause of death was CO, I urged that hyperbaric oxygen be given to the father Neil Shepherd and his then fiancé Ruth Beatson. Those I spoke to said they didn't speak English so a Greek friend kindly tried but also with little success. I telephoned the relatives with the same advice and spoke to Ruth's father who kindly reminded me about this at the inquest.
Later, I recommended that gas expert Harry Rogers undertake an examination of the boiler that killed the children. Harry gave evidence at the inquest. I also recommended the barrister, Leslie Thomas, now QC. In our opinion, without Harry's evidence, Leslie's skill and the parents' courage and determination, the facts would not have emerged. I also wrote to the police on the 3rd November 2006.
This all arose from our experience of victims who, not knowing what to do, called to ask for independent and impartial help.
The inquest verdict was unlawful killing and the jury found a breach of Thomas Cook's duty of care.
For more on the case, please go to the following links:
http://news.sky.com/story/goodwill-payout-to-family-of-corfu-children-10358646
http://www.independent.co.uk/news/business/analysis-and-features/carbon-monoxide-deaths-from-a-tragedy-to-a-corporate-disaster-for-thomas-cook-10259735.html
The Coroner made his recommendations public on 6th October 2015
http://www.co-gassafety.co.uk/corfu-inquest-hm-coroner-david-hinchliffs-reg-28-report-to-prevent-future-deaths/

CO-Gas Safety almost certainly has the best data on unintentional deaths and injuries from CO from all fuels in the UK from 1995.The charity received £50,000 in 2015 from Thomas Cook thanks to the parents of the Corfu children. However, its costs are roughly £30-35,000 a year and that it being run almost completely by volunteers with a little paid help for the data. At the time of writing this leaflet, the charity has no government or industry funding to continue to collect, collate & publish data and provide victim support. Please see http://www.co-gassafety.co.uk/information/co-gas-safetys-statistics-of-deaths-and-injuries/ and please download our years of data from 1995 and our pie charts. This is updated yearly.

CO-Gas Safety has lobbied for prime time TV warnings about CO since 1995.

Company Registration No. 03084435 Charity Registration No. 1048370

© Sponsored by Kane International

Illustrations of CO symptoms and grave by competition winner Chihiro.
All other illustrations by John O'Leary http://www.johnolearyillustration.co.uk

SOTER

Carbon Monoxide (CO) Interlock

Every year there are countless deaths and injuries caused by carbon monoxide poisoning across the world.

The CO interlock is designed to be installed alongside a gas boiler and can automatically turn off the defective appliance upon the activation of any BS 50291 CO alarm thus stopping the production of CO and saving lives. It achieves this by using our patented alarm monitoring system to listen, learn and react to the audible sound produced by a CO detector.

SOTER is recognised for safety...

It's been a product and successful year for Project SOTER having taken home the H&V News Awards for Safety Initiative of the Year 2018 at the Grosvenor Hotel in London..

Sean Lock (host), Tom Bell (Northern Gas Networks), Ben Kuchta (Project SOTER) and Benjamin Thorne (EMAP/H&V News Awards)

"I'd like to thank Tom Bell and Richard Hynes-Cooper from Northern Gas Networks that sponsored my attendance so that I could collect the award in person. It's a huge achievement that the company will be looking to scale up."

- **Ben Kuchta, creator of SOTER**

Real world application…

During the blind field trials, SOTER reacted to a real world CO alarm activation where the flue had split. A damaged case seal allowed high levels of carbon monoxide to enter the room.

SOTER isolated the appliance and reported the incident automatically to our emergency response team that was on standby.

The appliance was made safe and occupants that were in the area of the appliance at the time of activation were deferred for medical treatment as a precaution. No symptoms, injuries or deaths occurred nor reported. SOTER was removed and reviewed which lead to the improvement of its electronic power supply.

Independent, registered charity CO-Gas Safety director Stephanie Trotter OBE says, 'we welcome any technological invention that will save lives and preserve health and I think this is brilliant.'

Chris Bielby, MBE, Chairman of the Gas Industry Safety Group says, 'by isolating the dangerous appliance at the source, SOTER is a significant innovation capable of improving safety by reducing injuries and fatalities caused by carbon monoxide poisoning.'

Key changes through 2018...

Throughout 2018 we've implemented some key changes to the business, product and intellectual property (IP). From March 2018 all IP and development had been transferred from Quantic Corporation Limited to Kuchta Group Ltd.

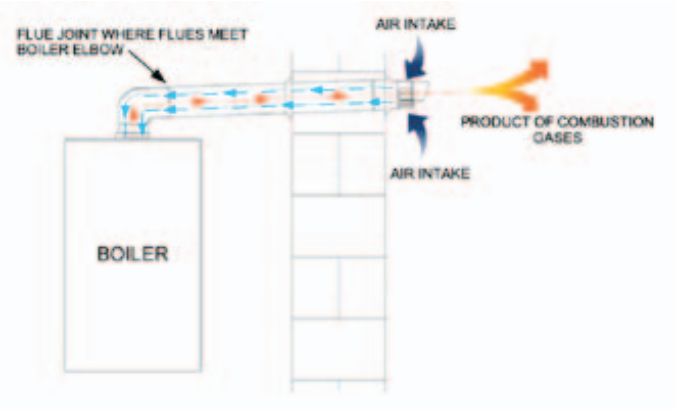
We're now holding a number of *Engagement Sessions* around the UK as a follow on from the expressions of interest that we received during 2018. The *Engagement Sessions* are open to those who wish to formally declare interest and will run until March 2019. There are currently three products available; the CO interlock - both in standard or variable specification, leasing of intellectual property within certain territories or a hybrid of the two.

We have also made significant progress on a specific conceptual communication protocol that we will be showcasing to various industry stakeholders through 2019.

Further information about the *Engagement Sessions,* field trials, communication protocols, project SOTER or the company can be provided by emailing ben@kuchtagroup.co.uk

With 18 years of experience of installing and maintaining boilers for landlords, it became clear to me that a boiler flue cutting jig was needed to assist installers in the task of cutting boiler flue systems accurately and safely.

Flues are designed with a double pipe; a small pipe taking the used products of combustion to be expelled outside and a larger outer pipe taking in the fresh air that is used by the boiler to burn the gas efficiently.



It is essential that the larger pipe takes in fresh air, without being polluted by the products of combustion that are being expelled by the smaller pipe. Therefore, it is vitally important that the inner pipe and outer pipe are cut to the correct measurements. There are known and agreed safety measurements for this that are provided by the manufacturer of the flue. The fitter of the flue must cut the pipe correctly and without causing damage, or any sort of slant, to the end that is cut.

In 2014, I started to design a product that would benefit both the boiler installer and the householder by eliminating the risk of incorrect cutting of boiler flues.

The **FLUESHOE** is the first product to be developed specifically to assist boiler installers to cut both flues and flue extensions in an accurate, safe and more professional way.

BENEFITS:-

1. The **FLUESHOE** has been designed to hold a flue between three V-shaped blocks with rubber bases. These blocks eliminate almost all movement or wobble of the flue during the cutting process.

This picture shows a flue placed in the jig, with a trimmer disc engaged at one end to clamp the flue in place and assist rotation when cutting the outer flue.

2. Once the outer flue is cut to length, the flue trimmer is slid down the inner flue and holds the inner flue centred and steady for cutting. There is no need to measure the inner flue; the trimmer is designed to give a cut of either 10mm or 20mm (depending on the boiler manufacturer's instructions).

This picture shows that, having removed the cut off from the outer flue, the trimmer disc is then engaged onto the inner flue. To ensure a cut of 10mm longer than the outer flue (as the manufacturer's instructions specify), the trimmer disc has a predetermined thickness.

3. Using the **FLUESHOE**, it is not possible to cut the inner flue too short, giving the installer total confidence that the safety of the flue has not been compromised.

4. The **FLUESHOE** trimmers are designed to hold the most common flue diameters; 110mm/70mm and 100mm/60mm.

This picture shows how it is still possible to cut both the inner and outer flues to the same length using the **FLUESHOE**, if the manufacturer's instructions require it.

The very best of innovation comes from within the industry it is intended for; working within this field myself, I saw this need and invented the **FLUESHOE** to solve it.

The **FLUESHOE** was showcased as a prototype product in May 2016 at the Installer Show in Coventry and received an overwhelmingly positive response from the plumbing & heating trade. It then went into full production in September 2016.

The **FLUESHOE** is currently available from two major boiler manufacturers' installer loyalty schemes and we have also distributed the product to many national and independent merchants throughout the UK.

We always ask for feedback when we sell the **FLUESHOE**. So far 1,400 have been sold and we have received no negative feedback.
Registered Gas Engineer Des Wilson says, 'this looks great - it's designed to solve a problem I know well - even experienced engineers struggle with this. I would buy it and use it.
"An absolute must for every boiler installer, simple to use, and the results are consistently perfect" Paul - @KanePlumbing1
"A great addition to any engineers tool kit, no more struggling trying to hold the flue and cutting the pipe at the same time" Kevin - @kevgasandhtg

We welcome all comments, both good and not so good, as we are committed to improving our product at every opportunity.

Contact details:- Simon Brown, Mob. 07973 422 789
FLUESHOE Email simon@flueshoe.co.uk Website www.flueshoe.co.uk

Air Quality Issues from 1956 to the present day and beyond

There is no question that The Clean Air Act of 1956 was created at a time when 'Air Quality' issues were quite different to our current circumstance.

Throughout the mid-20th Century enormous quantities of bituminous coal were being consumed for both domestic heating and industrial/commercial purposes, including electricity generation. As a consequence, due to atmospheric conditions, many major cities in the UK suffered severe bouts of 'smog' causing serious health conditions among the population. London was particularly affected at that time.

Public opinion was such that Government was forced to act to prevent any continuance of the problem and The Clean Air Act was introduced into law.

Over successive decades local authorities throughout the country introduced Smoke Control Areas in their worst affected areas to great effect. Today, virtually every main UK town and city enjoys a relatively clean atmosphere as a consequence of controls over what fuels are burned on domestic heating appliances, many of which are more efficient and better controlled than their 1950's counterparts. Additionally, the majority of industrial/commercial consumers of coal and heavy oil have switched to gas firing.

Solid fuel burning appliances are now required to burn authorised smokeless fuels manufactured to meet government minimum standards. These standards encompass both levels of visible smoke and sulphur content. All authorised smokeless fuels must contain a sulphur content of 2% or less (to minimise sulphur dioxide emissions).

Of course, over the period since the 1950's many consumers switched their home heating to gas fired appliances and solid fuel is today in the minority. Nationwide, it is estimated less than 5% of home heating is derived from logs and smokeless solid fuel and much of that usage is classified as supplementary heating, providing additional back up heat and to create the ambience that a gas fired central heating lacks.

Thus, the proportion of homes in London using solid fuel is likely to be no more than the national average, all of which will be subject to a Smoke Control Order. Specifically:
1. Burning bituminous coal is illegal (unless used on an exempted appliance able to burn bituminous coal smokeless – but are no longer manufactured)
2. Burning wood is illegal (unless used on a DEFRA exempted appliance)
3. Or you may burn an authorised smokeless fuel.

I feel that were the above legal limitations imposed by the various local authority Environmental Health Officers responsible, the concerns surrounding particulate emissions from wood burning would diminish. As reported previously, policing the Clean Air Act does not appear to be a priority with the majority of Councils.

However, Sadiq Khan does make reference to the new generation of high efficiency modern stove designs able to burn wood with less particulate emissions. The Stove Industry Alliance members are proud to promote their 'eco-design ready' appliances, which will help to address the perceived problem.

Lastly, I challenge Sadiq Khan's assertion that only half of the capital's air pollution is caused by on-road vehicles and that the remaining half comes from the River Thames, machinery and domestic solid fuels. Clearly, I do not have access to the data he has at his disposal, but common sense says the numbers of river vessels, building site machines and domestic fires cannot equal the amount of traffic movements in the city.

Indeed, the DEFRA report 'Air Pollution in the UK 2014' issued September 2015 states in section 2.3 – 'Most Air Quality Management Areas in the UK are in urban areas and have been established to address the

contribution to air pollution from traffic emissions of nitrogen dioxide or PM10. Transport is the main source in 97% of the AQMA's declared for NO2; this is predominantly road transport but may include some other types, eg trains or shipping. A further 2% result from transport mixed with either domestic or industrial sources, and less than 1% from non-traffic sources alone.'

However, a report issued by the Royal College of Physicians in 2016 titled 'Every breath we take – The lifelong impact of air pollution' attributes major significance to road traffic highlighting the fact that in 2012 road traffic in the UK was 10 times higher than in 1949. Exhaust emissions from modern cars was tightly regulated today but nitrogen dioxide and particulates from diesel engines have been poorly controlled and remains a problem. On the subject of domestic heating the report goes on to state 'The increasing popularity of wood burning for heating, in part due to policies to reduce CO2 emissions, risks undoing some of the air quality improvements that have resulted from the widespread adoption of gas for domestic heating. Particles from wood burning can now be found each winter in our urban air, mainly at weekends, with wood burning accounting for between 7% and 9% of London wintertime particle pollution'.

A report from Kings College London – 'Contribution of wood burning to PM10 in London' concludes 'The contribution of levoglucosan and aethalometer measurements as wood burning tracers provide new insights into sources of airbourne particles in London….. Both methods suggest that wood smoke PM10 was greatest during evenings and weekends, which also reflected domestic burning. Poor correlations between wood burning and daily mean temperature suggest that Londoners are burning wood as a decorative or secondary heating source rather than as a primary form of heating. This secondary heating is unlikely to merit investment in specifically designed wood stoves but likely reflects the UK practice of burning wood in existing fireplaces and grates originally designed for coal burning. Smoke Control Areas, introduced to almost all Greater London under the 1956 Clean Air Act, should prohibit the burning of wood unless it is carried out in a specifically designed and authorised boiler or stove. The evidence of widespread wood burning in London may suggest that smoke control legislation is no longer effective.'

Lastly, following press coverage on 18th August 2018*, DEFRA issued a press release dated 14th January 2019 outlining their future strategy for cleaning up our air and saving lives.

'Clean Air Strategy 2019' sets out Government proposals to reduce air pollution over the next decade. Their plans highlight the impact of traffic emissions on the environment with the bold objective of removing all diesel and petrol vehicles from UK roads by 2040. In addition, they plan to tackle the burning of polluting fuels on domestic fires in favour of clean burn stoves by 2022.

Most encouraging however is the aim of exploring ways of giving local authorities power to increase the rate of upgrade to more efficient and less polluting appliances. In addition, they plan to bring existing smoke control legislation up to date and make it easier to enforce. As explored above, this last element is essential to limit the uncontrolled burning of unauthorised fuels in urban areas.

Let us hope these aims and objectives come to fruition.

Jim Lambeth
December 2018
References

https://uk-air.defra.gov.uk/library/annualreport/viewonline?year=2014_issue_1
https://www.rcplondon.ac.uk/file/2914/download?token=qjVXtDGo
http://dx.doi.org/10.1016/j.atmosenv.2013.12.037
https://www.gov.uk/government/news/government-launches-world-leading-plan-to-tackle-air-pollution
* Times Newspaper – 18th August 2018
https://www.gov.uk/government/publications/clean-air-strategy-2019

Patients With Carbon Monoxide Poisoning and Subsequent Dementia

A Population-Based Cohort Study

Ching-Yuan Lai, MD, Yu-Wei Huang, MD, Chun-Hung Tseng, MD, Cheng-Li Lin, MSc, Fung-Chang Sung, PhD, MPH, and Chia-Hung Kao, MD

Monitoring Editor: Li Yong.

Abstract

The present study evaluated the dementia risk after carbon monoxide poisoning (CO poisoning).

Using the National Health Insurance Research Database of Taiwan, a total of 9041 adults newly diagnosed with CO poisoning from 2000 to 2011 were identified as the CO poisoning cohort. Four-fold (N=36,160) of non-CO poisoning insured people were randomly selected as controls, frequency-matched by age, sex, and hospitalization year. Incidence and hazard ratio (HR) of dementia were measured by the end 2011.

The dementia incidence was 1.6-fold higher in the CO exposed cohort than in the non-exposed cohort (15.2 vs 9.76 per 10,000 person-years; n=62 vs 174) with an adjusted HR of 1.50 (95% CI=1.11–2.04). The sex- and age-specific hazards were higher in male patients (adjusted HR=1.74, 95% CI=1.20–2.54), and those aged <=49 years (adjusted HR=2.62, 95% CI=1.38–4.99). CO exposed patients with 7-day or longer hospital stay had an adjusted HR of 2.18 (95% CI=1.42, 3.36). The CO poisoning patients on hyperbaric oxygen (HBO2) therapy had an adjusted HR of 1.80 (95% CI=0.96–3.37).

This study suggests that CO poisoning may have association with the risk of developing dementia, which is significant for severe cases. The effectiveness of HBO2 therapy remains unclear in preventing dementia. Patients with CO poisoning are more prevalent with depression.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4706265/

Medicine (Baltimore). 2016 Jan; 95(1): e2418.

Published online 2016 Jan 8. doi: 10.1097/MD.0000000000002418

PMCID: PMC4706265

PMID: 26735545

Carbon Monoxide Poisoning and CFS/ME

By
Dr Raymond N. Perrin DO, PhD

Hon Senior Lecturer, Allied Health Professions Research Unit,
University of Central Lancashire,
Registered Osteopath, Neuroscientist
and Specialist in Chronic Fatigue Syndrome/ME.

A study by Knobeloch and Jackson in 1999 showed that chronic exposure to low levels of carbon monoxide can cause vague symptoms that are easily mistaken for other common illnesses. The authors argued that carbon monoxide exposure should be considered in the differential diagnosis of patients who present with chronic symptoms of headache, fatigue, dizziness, nausea and mental confusion, especially when these symptoms onset during the winter heating season.

However, over the past 30 years I have treated many cases of CFS/ME where one of the causes of the illness is exposure to Carbon Monoxide. CFS/ME (now known in The USA as Systemic Exertion Intolerance Disease) is an example of a neuro-lymphatic disease and is characterised by severe, disabling fatigue together with a combination of symptoms made worse by exertion.

The lymphatic system enables our bodies to get rid of harmful substances and although there was always the belief that no true lymphatic system existed in the brain and spinal cord, scientists in the USA and Finland have finally proven that fluid within the central nervous system acts as a lymphatic fluid and drain poisons and large molecules into lymphatic vessels lining the brain, draining toxins out of the body or into the liver where they are broken down.

However, emotional or physical stress, an over-reaction to infections or pollution can all lead to an over-strain of the sympathetic nervous system due to a build-up of toxins in the fluid around the brain and the spinal cord. A source of toxins that could potentially trigger CFS/ME is environmental, whether it is heavy metal pollutants such as mercury, petrochemical exposure or organophosphates used in farming and air pollutants such as Benzene, chloroform, CFCs, PCBs, toluene and **carbon monoxide.**

These toxins are meant to drain through lymph ducts in the face, neck and spine mostly at night when we are in deep, restorative sleep known as delta wave sleep. Unfortunately, in a CFS/ME sufferer these normal drainage points are congested and, as they get little delta wave sleep, the toxins stay in the brain at night with some draining away during the day. A backflow of toxins into the central nervous system creates further damage to the brain and affecting functions such as sleep, temperature control, moods as well as pain in muscles and joints all over the body. Other symptoms include reduction in concentration, difficulty reading, sinusitis, short-term memory problems, ‘muzziness’ in the head/brain fog, headaches, increased sensitivity to light and noise, nausea, sore

throat and dry eyes, but most of all it is the post-exertional malaise and fatigue that affects patients. This is due to the toxins stuck in the brain which makes most suffers feel poisoned.

Environmental problems should always be suspected when more than one person in a household who are not blood relatives develop CFS/ME, but in a practice specializing in the diagnosis and treatment of CFS/ME and fibromyalgia after spending 30 years in clinical research, I have seen many individual cases of patients who in their past were exposed to carbon monoxide fumes. Those lucky enough to survive carbon monoxide poisoning may end up with a life full of physical, and mental fatigue with constant pain and dysfunctional immune system and many more disturbing symptoms triggered by excess of carbon monoxide in their body.

In 1989 I developed The Perrin Technique™ which is an osteopathic approach that manually stimulates the fluid motion around the brain and spinal cord. Manipulation of the spine further aids drainage of these toxins out of the cerebrospinal fluid. Massage of the soft tissues in the head, neck, back and chest direct all the toxins out of the lymphatic system and into the blood, where they are detoxified in the liver. Eventually, with no poisons affecting the brain, the sympathetic nervous system begins to function correctly and health is restored. I am involved in clinical research with the NHS and hopefully one day soon this approach will be more readily available for the many long-term sufferers of carbon monoxide poisoning.

REFERENCES:

Hives L, Bradley A, Richards J et al. Can Physical Assessment techniques aid diagnosis in people with chronic fatugue syndrome/myalgic encephalomyelitis? a Diagnostic Accuracy Study. BMJ OPEN 2017; 0:e017521. doi:10.1136/ bmjopen-2017-017521

Knobeloch LR Jackson 1999. Recognition of chronic carbon monoxide poisoning. Wisconsin Medical Journal 98(6):26-9

Perrin R,N. 1993 Chronic Fatigue Syndrome, a review from the biomechanical perspective. British osteopathic journal; vol xi.

Perrin RN, Edwards J and Hartley P (January/February 1998) An evaluation of the effectiveness of osteopathic treatment on symptoms associated with Myalgic Encephalomyelitis. A preliminary report . Journal of Medical Engineering and Technology , 22(1), 1-13.

Perrin RN. Lymphatic Drainage of the Neuraxis in Chronic Fatigue Syndrome: A Hypothetical Model for the Cranial Rhythmic Impulse. Journal of the American Osteopathic Association, 107(06), 218-224. 2007.

Perrin RN. THE PERRIN TECHNIQUE, HAMMERSMITH PRESS, London. 2007.

Alphabetical list of recorded deaths from unintentional carbon monoxide poisoning 01.09.95 to 31.08.18

The following is an extract of a list of UK unintentional carbon monoxide fatalities that appears on our website, at http://www.co-gassafety.co.uk/information/deaths/.

All these deaths have been in the public domain but if anyone wishes us to remove a name from our website then of course we will do so (we would also look into a request to change any detail, such as the appliance or fuel involved). However, we hope that families and friends will understand that the reason for having a list of names is to bring it home to the authorities that those who have died of unintentional carbon monoxide poisoning were people with loved ones, not a mere list of statistics.

CO-Gas Safety endeavour to check every death we become aware of with the Coroner concerned and most Coroners and their officers are very helpful. We are extremely grateful to them. We also confirm details of fatal incidents with other agencies such as the Health & Safety Executive, Marine Accidents Investigation Branch, Police and Fire & Rescue Services, the Solid Fuel Association and others as appropriate, to ensure we have as up-to-date and complete records as possible of all aspects of the events. Our thanks go to the officers and staff who help with this research. We now have some kind of official confirmation for over 90% of the fatal cases we hold details of in our database.

List of abbreviations used in the list of UK deaths:

BBQ	barbeque	OO	owner occupier
CHB	central heating boiler	PRH	portable room heater
HA	housing association	PR	private rented
LPG or BG	liquid petroleum gas or bottled gas	Temp	Temporary
OPH	outdoor patio heater	-	unknown

Surname	Forename	Age	Date of Death	Location	Situation	Tenure	Fuel	Appliance
Smith	Wendy	49	19/07/2007	Mid Glamorgan	House	OO	Mains gas	Back boiler
Smith	Richard	30	13/11/2010	Cornwall	House	OO	Mains gas	Cooker
Soutter	Karl Daniel	14	10/10/2000	Wiltshire	Caravan or mobile home	OO	LPG or BG	Room heater
Stafford	Irene	73	19/07/2001	Nottinghamshire	House	-	Solid	Room heater
Stamp	Nicholas	39	25/12/2001	Derbyshire	Garage	OO	Petrol/diesel	Engine
Stanford	Gwen	91	22/01/2009	County Antrim	House	-	LPG or BG	Cooker
Stanley	Gwenda Eileen	73	03/04/2018	Staffordshire	House	OO	Solid	CHB
Stenning	Kay Nixon	30	29/11/1998	Shropshire	Hotel	Temp	LPG or BG	CHB
Stepe	Uldis	37	08/01/2009	West Yorkshire	Flat	PR	Mains gas	CHB
Sterkis	Artis	37	25/08/2011	Grampian	Boat	Other	Petrol/diesel	Other
Stevens	Gladys	79	31/01/1999	Derbyshire	House	OO	Mains gas	Back boiler
Stewart	Gary Alexander	8	10/04/1998	Tayside	Caravan or mobile home	Temp	LPG or BG	PRH
Stillwell	Marion	61	26/10/2006	Kent	House	OO	Solid	Back boiler
Stockdale	William Joseph	60	29/04/2016	County Down	House	-	Oil	CHB
Stone	Emma-Jane	16	30/12/2000	Cumbria	House	OO	Mains gas	CHB
Stone	Joan	47	30/12/2000	Cumbria	House	OO	Mains gas	CHB
Stone	Peter	50	30/12/2000	Cumbria	House	OO	Mains gas	CHB
Stretton	Keith	47	12/05/2001	Essex	Vehicle	OO	Petrol/diesel	Engine
Sutherland	Leslie	66	07/03/2003	Tyne & Wear	House	HA	Solid	Room heater
Swallow	Dorothy Ann	71	26/12/2013	West Sussex	House	OO	Petrol/diesel	Generator
Swallow	Kenneth David	70	26/12/2013	West Sussex	House	OO	Petrol/diesel	Generator
Sykes	George	75	20/01/1997	Oxfordshire	House	Council	Solid	Room heater
Sykes	Doris	88	17/11/2006	West Yorkshire	House	OO	Solid	Room heater
Sykes	Thomas Winston	90	17/11/2006	West Yorkshire	House	OO	Solid	Room heater

CO-GAS SAFETY'S STATISTICS ON DEATHS AND INJURIES*

UK deaths caused by unintentional Carbon Monoxide (CO) poisoning

(Between 1 Sept 1995 - 31 Aug 2018): **Total: 697**

Note *Information is collected from the International Press Cuttings Bureau on a daily basis and from other sources. Coroners are contacted about all deaths. For further details please visit www.co-gassafety.co.uk

TENURE	
Total Number of CO unintentional deaths by Tenure: (1 Sept 95 – 31 Aug 2018):	
Owner/Occupier	400
Private Rental	70
Council	67
Housing Association	19
Owned by employer	10
Temporary (e.g. hotel, tent)	29
Other (e.g. owned by relative)	18
Unknown	84

SITUATION					
Total Number of CO unintentional deaths by Situation (1 Sept 1995 – 31 Aug 2018):					
House	393	**Garage**	33	**Other**	6
Flat	101	**Shed or similar**	17	**Unknown**	4
Caravan or mobile home	32	**Commercial premises**	26		
Boat	33	**Tent**	17		
Vehicle	29	**Workplace**	6		

FUEL TYPE

Total Number of CO unintentional deaths by Fuel breakdown and CO-Gas year (1 Sept to 31 Aug):

	95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	TOTAL
Gas (mains)	29	20	18	21	14	15	8	9	8	14	14	9	12	18	4	11	1	5	3	3	4	·	1	**241**
Gas (portable)	9	8	5	6	10	6	7	7	6	4	7	4	3	7	6	3	3	1	3	2	2	·	·	**109**
Solid	21	18	23	13	17	14	4	8	5	7	8	14	11	3	8	7	12	6	6	5	2	1	2	**215**
Petrol/diesel	6	7	3	9	3	7	6	1	2	3	2	10	6	4	4	7	3	5	4	2	3	8	·	**105**
Oil	·	2	·	·	·	·	·	·	·	·	·	1	·	1	1	·	·	1	·	·	1	·	·	**7**
Paraffin	·	·	·	1	1	·	·	·	·	·	·	·	1	·	·	·	·	·	·	·	·	·	·	**3**
Unknown	·	1	·	·	1	·	2	1	2	1	·	·	·	·	·	1	1	3	2	·	1	1	·	**17**
Total	**65**	**56**	**49**	**50**	**46**	**42**	**27**	**26**	**23**	**29**	**31**	**38**	**33**	**33**	**23**	**29**	**20**	**21**	**18**	**12**	**13**	**10**	**3**	**697**

Note: Zane Gbangbola, aged 7, died in February 2014. The Coroner's verdict in September 2016 was that Zane died of carbon monoxide poisoning. However, the blood test found only 8% carboxyhaemoglobin and we have never heard of a death of an otherwise healthy person dying at such a low level. The family disputes the finding and continues to maintain that Zane died of hydrogen cyanide from a flood from a landfill site, so we have not included this death. see http://www.dailymail.co.uk/news/article-3794537/Justice-Zane-New-hope-parents-blamed-death-flood-tragedy-son-MP-attacks-seriously-flawed-inquest.html

Near-Misses from Unintentional Carbon Monoxide Poisoning in UK

(1 Sept 1995 - 31 Aug 2018) **Total: 5541**

Of these, more than 2350 required hospital treatment and over 450 had lost consciousness

95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	Total
452	448	320	376	327	300	97	149	178	216	152	331	214	260	197	178	223	310	300	148	191	144	30	**5541**

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.

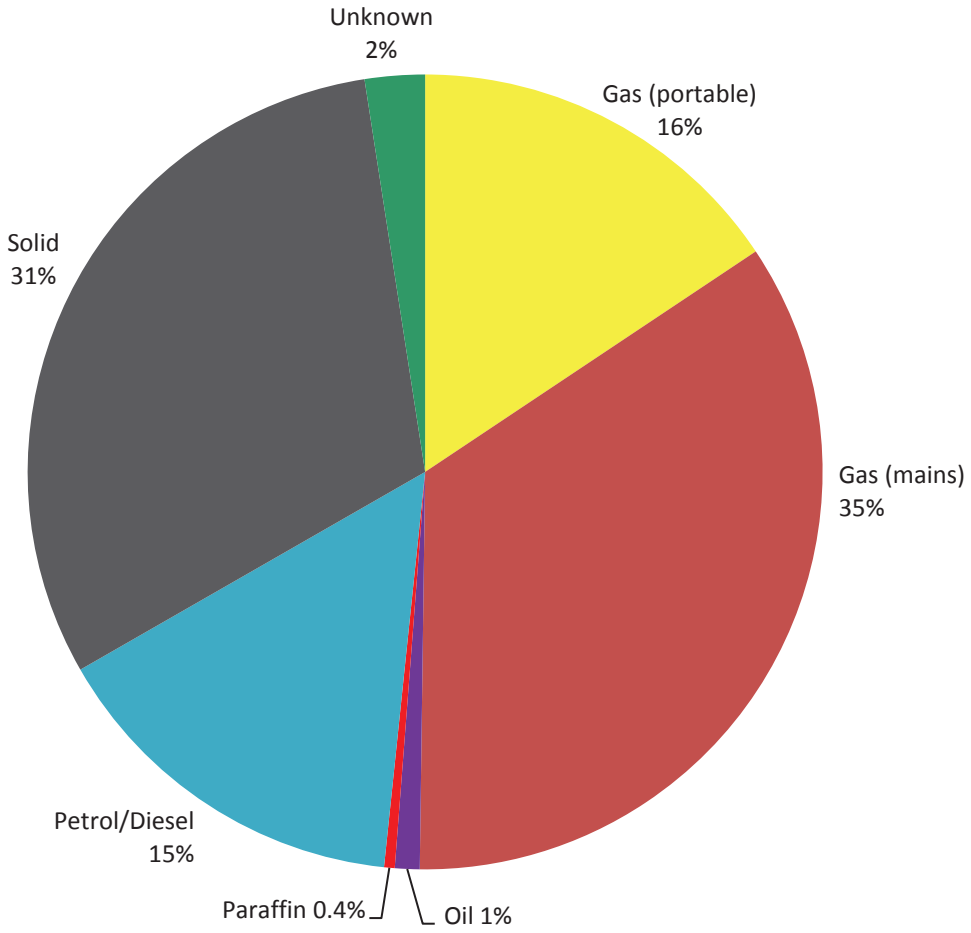
As percentage figures are quoted as whole numbers (and to one decimal place for any results less than 1%), the sum of all categories quoted may not give a total of exactly 100%.

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

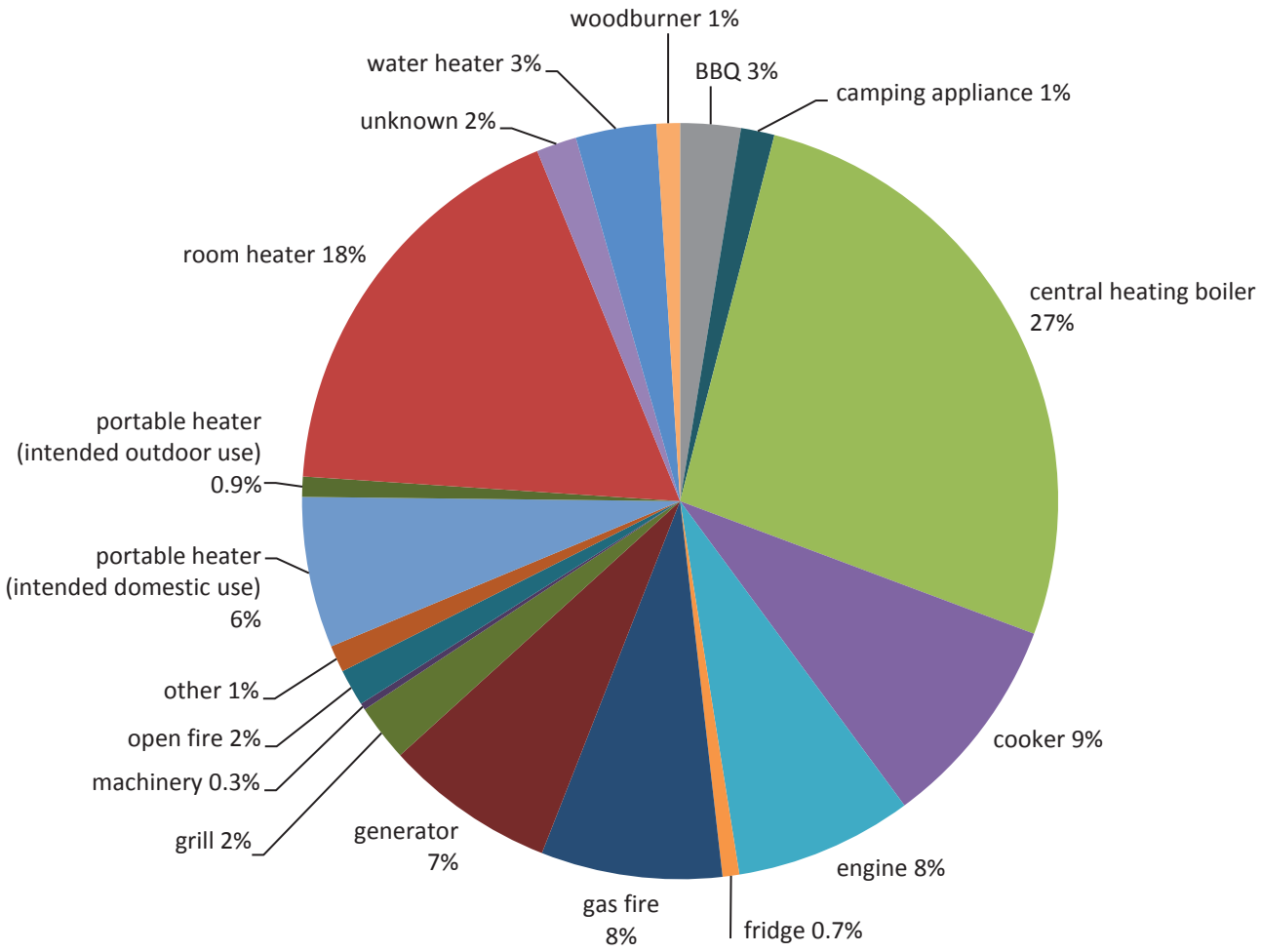


CO-Gas Safety comment

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

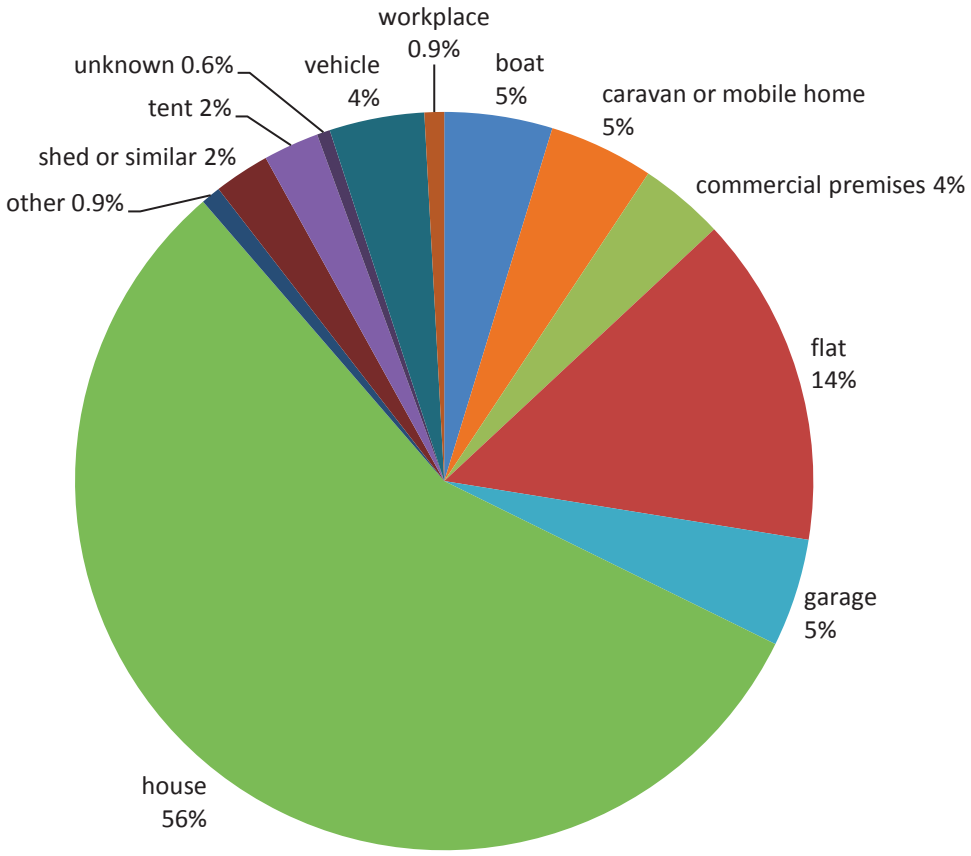


'camping appliance' includes items other than BBQ's, such as gas lamps and gas or paraffin stoves.
'central heating boiler' includes mains gas, oil and solid fuel systems. Back boiler systems are included in this category.
'cooker' includes hobs, range cookers and permanent stoves (not portable camping 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

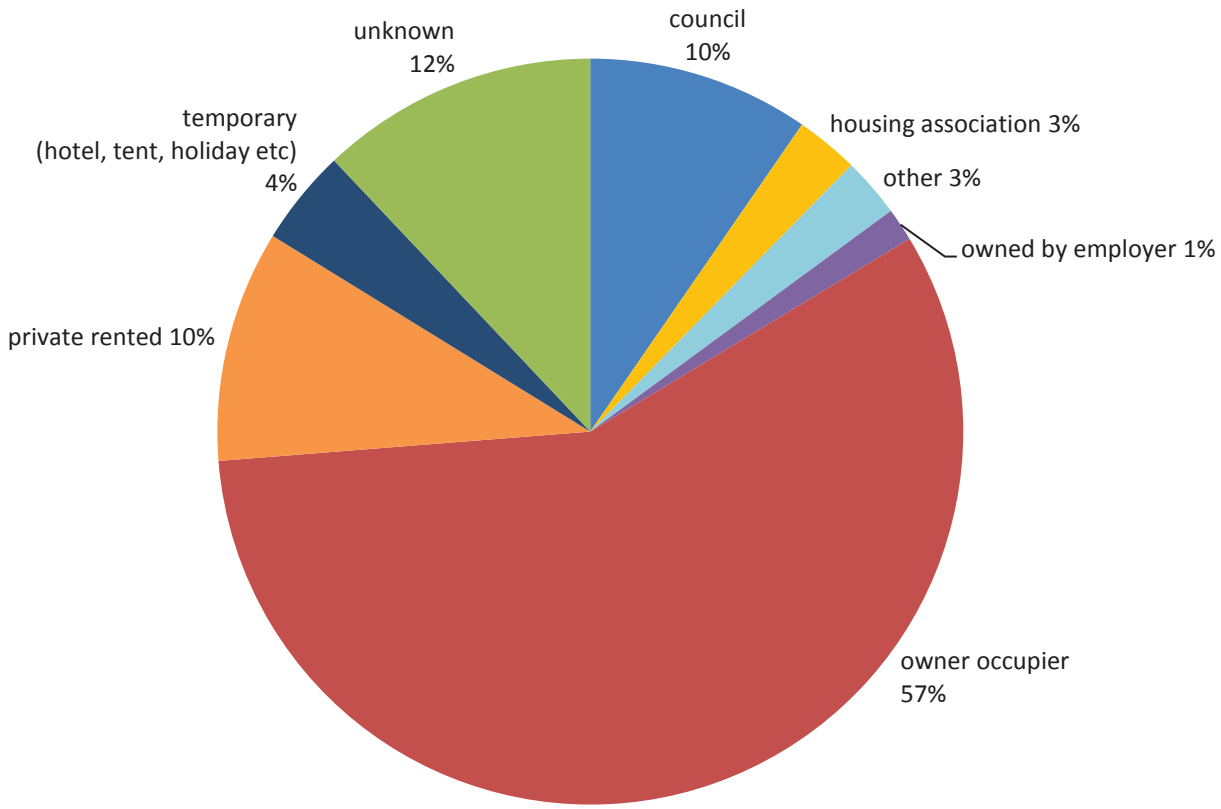


'commercial premises' includes shops, public houses, hotels, restaurants & guest houses.
'flat' includes bedsits, and both purpose-built flats and those converted from larger dwellings.
'house' includes bungalows, detached, semi-detached and terraced houses.
'other' includes a greenhouse, care homes, 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).

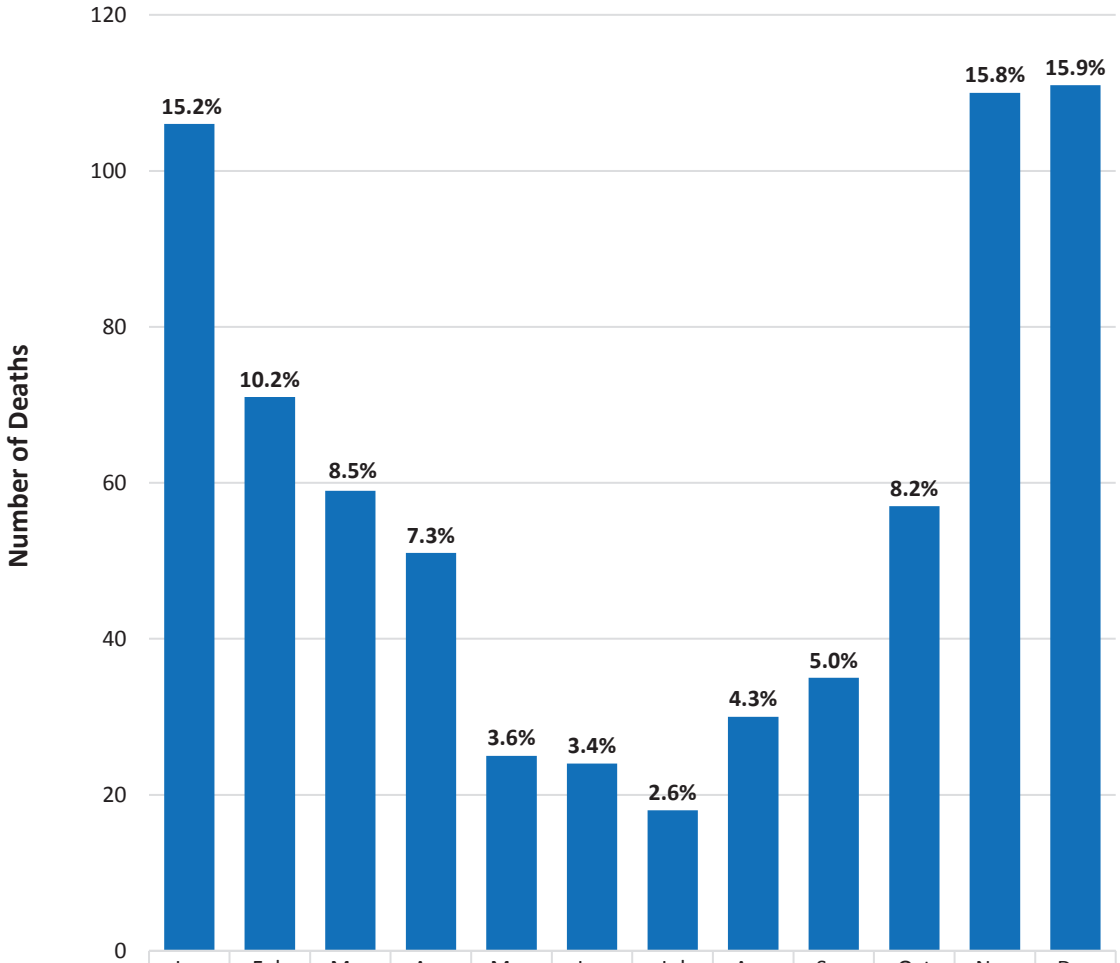
TENURE TYPE relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2018



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

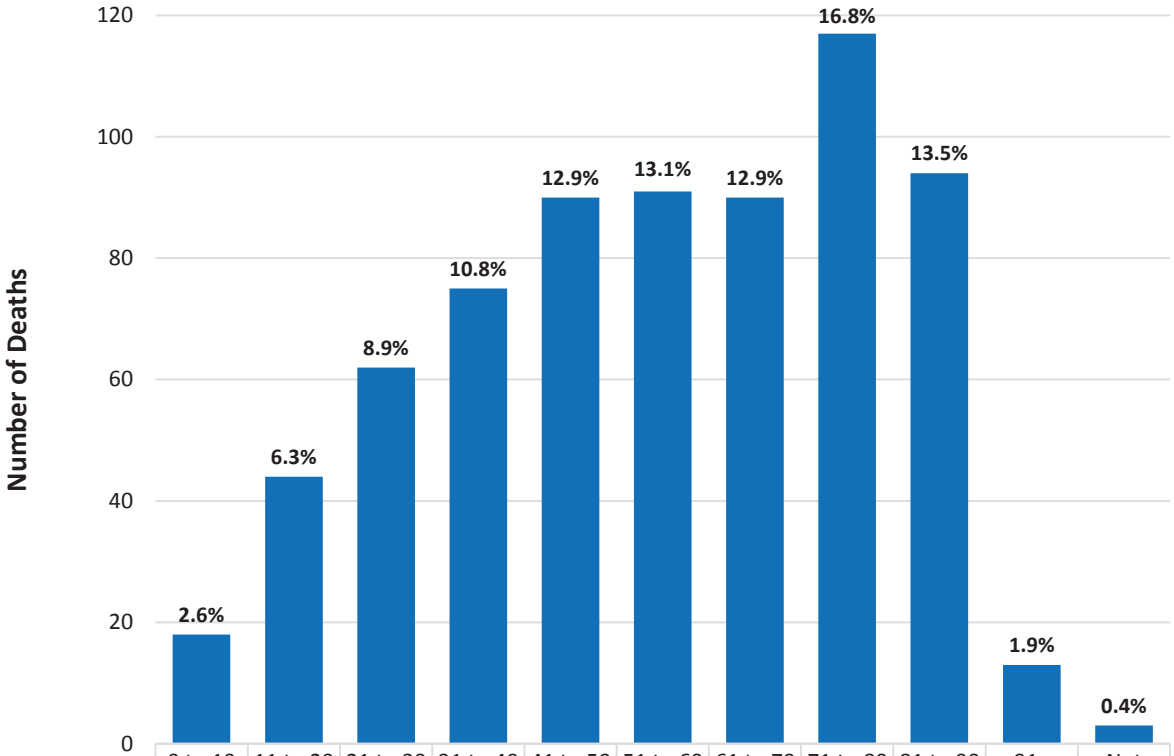


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
No. of Deaths	106	71	59	51	25	24	18	30	35	57	110	111

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

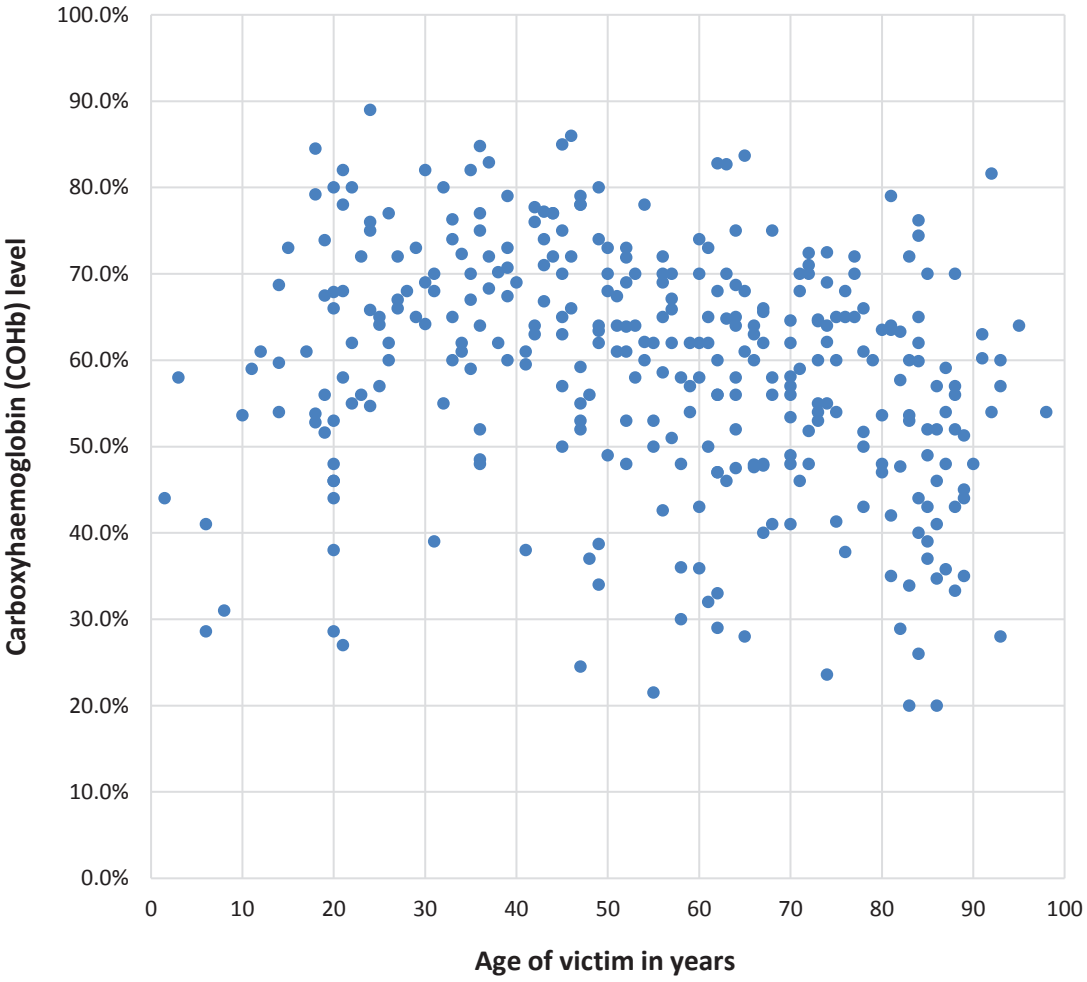
CO-Gas Safety comment

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.

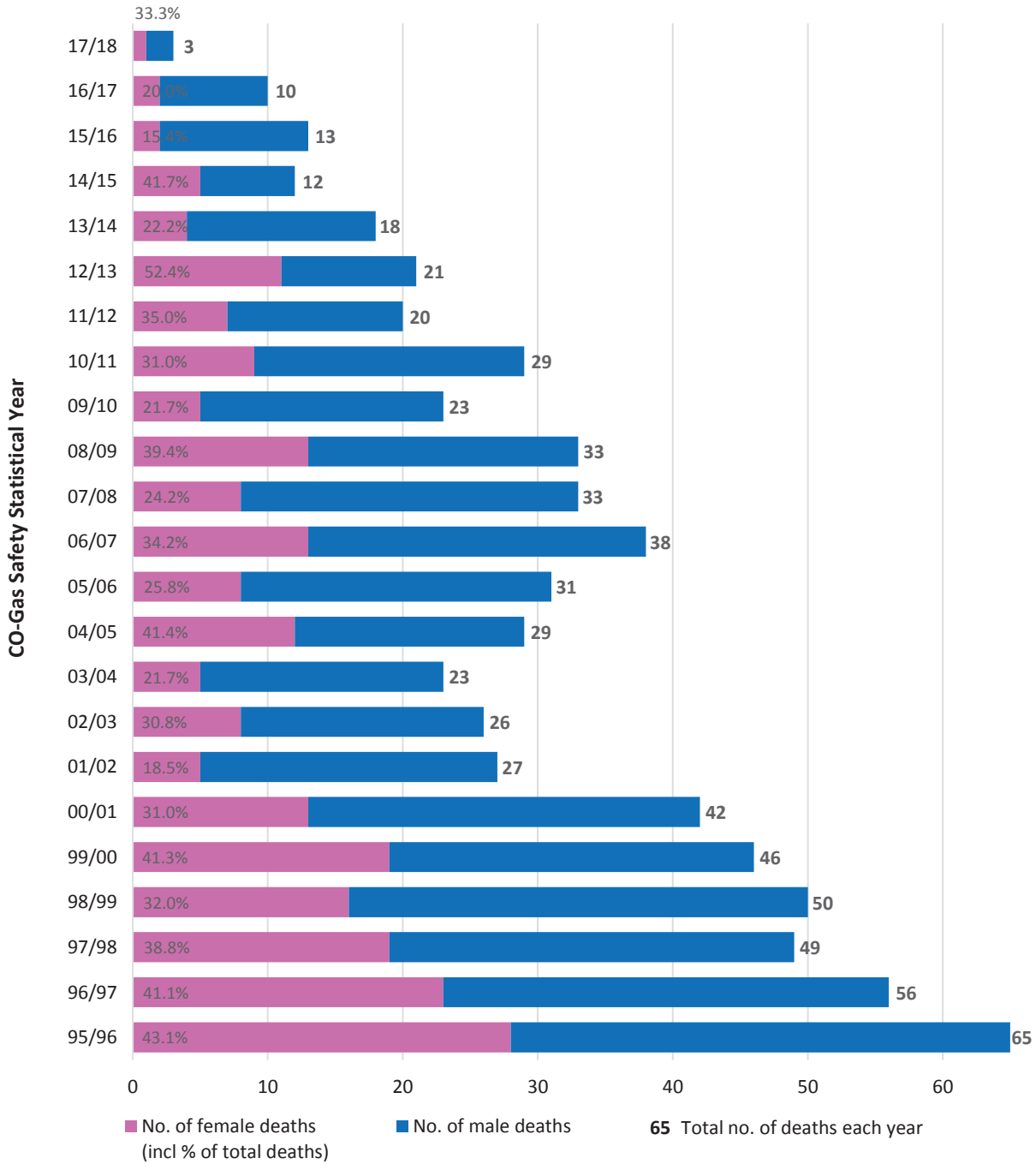
COHb LEVEL OF VICTIMS relating to UK deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2018



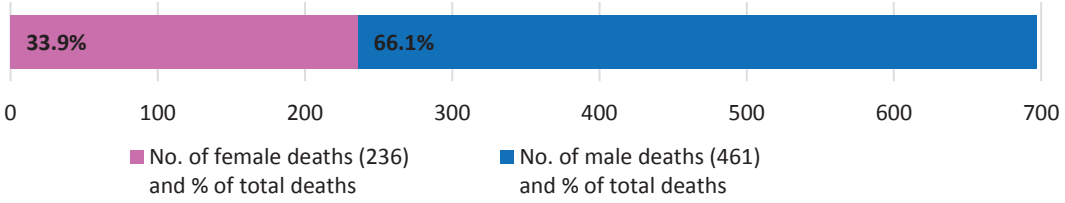
CO-Gas Safety comment

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.

Report on the CO-Gas Safety database by Dr Paul Hewson*

The CO-Gas Safety group have painstakingly collected information on deaths from carbon monoxide poisoning. The starting point for the charity was to obtain data from the Office for National Statistics (ONS). However, the official records at that stage were merely counts of all deaths where carbon monoxide was involved, including smoke inhalation in fires and suicides. Having spoken to families, it was felt that there was a need to compile an actionable dataset regarding unintentional deaths due to poisoning. CO-Gas Safety compiled the data from various sources, including newspaper reports and families, then confirmed the facts by writing to the Coroner concerned. To compile this data the charity needed the name of the deceased, the date of death and the place, or at least the Coronial area, of the death or body. CO-Gas Safety now have a set of records which go back to 1995 and that have been corroborated with authoritative records, usually a Coroner's record.

Expert-lead definitions of the relevant preventative and background information is extracted from the information provided by Coroners and used to provide a detailed resource on risk factors for CO poisoning leading to death. The aim of the group is to record unintentional poisoning and as such they exclude intentional deaths such as murder and suicide.

The dataset is a unique resource, providing information on prevention factors which could inform actions to reduce the number of preventable deaths from carbon monoxide poisoning.

With difficulty, some official statistics on carbon monoxide-related deaths can be obtained. It has been possible to find one table published by the ONS reporting carbon monoxide deaths in 2015 (footnote 1). Underlying this table is a data extraction which takes all deaths where the ***underlying cause*** of death was "accidental" and where the ***secondary cause*** of death was "carbon monoxide poisoning". These causes are recorded using the International Classification of Disease, 10th edition (ICD-10) codes. Codes V01 to X59 cover a range of accident-related underlying causes; X47 specifically isolates gas inhalation. ICD-10 code T58 denotes a secondary cause of carbon monoxide poisoning. In the ONS table, a total of 53 deaths were identified as having an "accidental" underlying cause and a "carbon monoxide poisoning" secondary cause. Of these, 27 involved smoke, fire and flames. One other case was also defined as being the result of a transport accident. Thus, most relevant to the work of the CO-Gas Safety charity, are those remaining cases in the ONS table where ICD-10 code X47 was applied ("accidental poisoning by other gases and vapours") along with the secondary code T58 ("toxic effect of carbon monoxide"). In total, 25 such deaths were reported, 24 of which happened at home.

It would be hugely beneficial if these data were regularly made available to the CO-Gas Safety charity. There are different ways of accessing the national statistics on carbon monoxide poisoning. On querying NOMIS (www.nomisweb.co.uk), using ICD-10 code X47 ("Accidental poisoning by and exposure to other gases and vapours") the number of deaths recorded were 2013: 39; 2014: 40; 2015: 38; 2016: 31; 2017: 34. The implication here is that there are accidental deaths due to poisoning by gases other than carbon monoxide, as the 2015 figure of 38 is greater than the crosstabulation in footnote 1. Conversely, it is possible to obtain tables directly from the ONS website and see that ICD-10 code T58 (footnote 2, 3) is listed as a secondary cause for 155 deaths 2017. However, it should be noted that ICD-10 code T58 does include intentional self-harm (suicide). Whilst evidence from the US (footnote 4) suggests a large decline in carbon monoxide-related suicide over the last few decades, it is challenging to attempt to estimate the number of unintentional carbon monoxide-related deaths without having a tabulation containing both underlying cause and secondary cause. It does not appear at present that it is ***routinely*** possible to obtain numbers for unintentional death due to carbon monoxide poisoning.

It should also be noted that within the ICD-10 codes T66-T78 there are a further 3608 deaths listed by the ONS as due to "Other and unexplained effects of external causes". It is possible that at least some of these deaths may well be due to carbon monoxide poisoning. This is likely to be an area for ongoing

research, which could include automatic screening for CO poisoning at post mortem (as recommended by Baroness Finlay of the All Party Parliamentary Carbon Monoxide Group in 2011).

The discovery process conducted by the CO-Gas Safety group is currently onerous, requiring an exhaustive scan of local and national media to identify potential cases. This then leads to enquiries to relevant Coroners. It is therefore possible that the data represent an under-count of the numbers of deaths where unintentional carbon monoxide poisoning was a preventable causal factor.

The CO-Gas Safety data collection adds value in terms of identifying underlying features of large numbers of deaths, which can be used to inform and reinforce prevention efforts.

It would be helpful if the discovery process could be informed by making information collected under registration statute available to CO-Gas Safety under appropriate arrangements.

1. ONS file reference
https://www.ons.gov.uk/file?uri=/peoplepopulationandcommunity/healthandsocialcare/causesofdeath/adhocs/006135numberofdeathsfromaccidentalcarbonmonoxidepoisoning/numberofdeathsfromaccidentalpoisoningbycarbonmonoxide.xls

2. ONS page reference
https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/deathsregisteredinenglandandwalesseriesdrreferencetables

3. ONS file reference
https://www.ons.gov.uk/file?uri=/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/deathsregisteredinenglandandwalesseriesdrreferencetables/2017/drtables17.xls

4. https://www.atsjournals.org/doi/full/10.1513/AnnalsATS.201604-318OC

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Senior Data Scientist
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01392 440400; 07870 276748

*Dr Paul Hewson very kindly undertook this work for CO-Gas Safety. Paul is a volunteer statistician recruited through Statisticians for Society, a *pro bono* scheme created by the Royal Statistical Society to provide analysis and statistical work for charities that need help with data, such as that collected, collated and published by CO-Gas Safety.

Carbon Monoxide Awareness Course is an Education

by Tom Bell

On the 6th June 2018, I was invited by Warris to deliver the BPEC CO Awareness course to a group that he had assembled that had expressed interest in learning more about CO following sessions that he had delivered to local community and neighbourhood sessions in the Kirklees area.

The level of interest
This followed some community engagement work that had been sponsored by NGN and delivered by Highfield food Cooperative around energy in the home, little did I know about the diversity and levels of interest that was to follow.

I arrived at Bradford University, the training location, loaded up the presentation materials and prepared for attendees to arrive. When they arrived, I was introduced largely to community leads, and those keen to make a difference, a Charity worker that had climbed Everest, refugees from Syria, ladies from Kurdistan, some Indians who had settled in Bradford, a Chinese gentleman and an English charity worker and these, with others, made around 1 dozen people.

A global challenge
The BPEC course for those that have not been involved is largely a participative education piece, supported by core learning. The audience certainly participated and made me aware of the challenges that we have making people aware of the dangers of CO, and how global a challenge it is. Discussions ranged from cooking on indoor fires, cooking methods that involve almost smothering flames with pots, challenges around educating people about ventilation and the cost of servicing appliance, when money is so scarce. An understanding of private landlords' responsibilities, but fear of eviction if challenging said landlords. Many from their home countries had experienced directly or were aware of others that had experienced illness through CO.

People willing to give up their time
The course went quickly and whilst I have worked in this area, it was quite humbling that these people were willing to give up their time to share experiences, and commit to spread the word further through the most innovative methods:-

Ladies to discuss CO as part of women's group sessions

Taxi Driver who wants to talk CO in his Cab

Students to talk to peers about CO

Gardeners to take the discussion to the allotment

Benefit brought by CO-Gas Safety, BPEC & NGN working together
The real benefit being that they feel confident to talk about CO directly to their peers and relay messaging around CO that I would be very unlikely to reach, all brought about through the charity CO-Gas Safety and the support of BPEC.

I have been invited back on 14th February to deliver to another group and look forward to the session which I am sure will be diverse and equally rewarding.

Tom Bell
Head of Social Strategy
Northern Gas Networks

Safety Seymour
Created by
Cadent

Safety Seymour is a super hero bear who is on a mission to recruit children across the UK (through all the GDN's), to spread the safety messages around CO. Using drama, games, craft and fun, he brings the classroom to life, helping to imbed the pupils learning. Seymour then visits each child's house, to educate the wider family about how to stay safe from CO in their home.

Find us at :

https://cadentgas.com/about-us/safety-seymour

http://www.energynetworks.org/gas/she/co-safety-competition.html

You can also Tweet @safetyseymour

Some Info About the Scheme:-

Safety Seymour and the Interactive Arts Day - This is a scheme in primary schools for children in Yr 2 (age 6 - 7yrs) that helps to promote CO Awareness.

The initiative is in its 4th year running; is delivered across the country and has so far directly reached 9500 children.

Stephanie Trotter was kindly invited to attend a session at a school. Stephanie watched Emmi Isham (of Bonanza Creative, on behalf of Cadent) and Safety Seymour in action at High Wych Primary School on 17th January 2019. The class was of six to seven year olds, two thirds boys and one third girls who were mostly energetic and challenging. All the pupils engaged with Emmi and Safety Seymour. The children seemed to take in the vital messages as well as having great fun. Stephanie was impressed and delighted.

HUGELY SUCCESSFUL PRIZE GIVING 2018

for the CO Awareness Competition at the House of Commons
by the Gas Distribution Networks

Reproduced by kind permission of Paul Heartfield/Policy Connect

CO-Gas Safety congratulates the Guild of Master Chimney Sweeps for Launching a carbon monoxide protocol for Chimney Sweeps

Members of the Guild of Master Chimney Sweeps

Preserving the evidence

If a carbon monoxide (CO) incident occurs or is suspected, it is vital that evidence is preserved, not disturbed, (think CSI investigates on TV!).

An investigation may be needed to find out if people have been exposed to CO and if so, how many parts per million (PPM).

Investigation checks that the right medical treatment is given and if necessary, provides valuable evidence for any future legal proceedings.