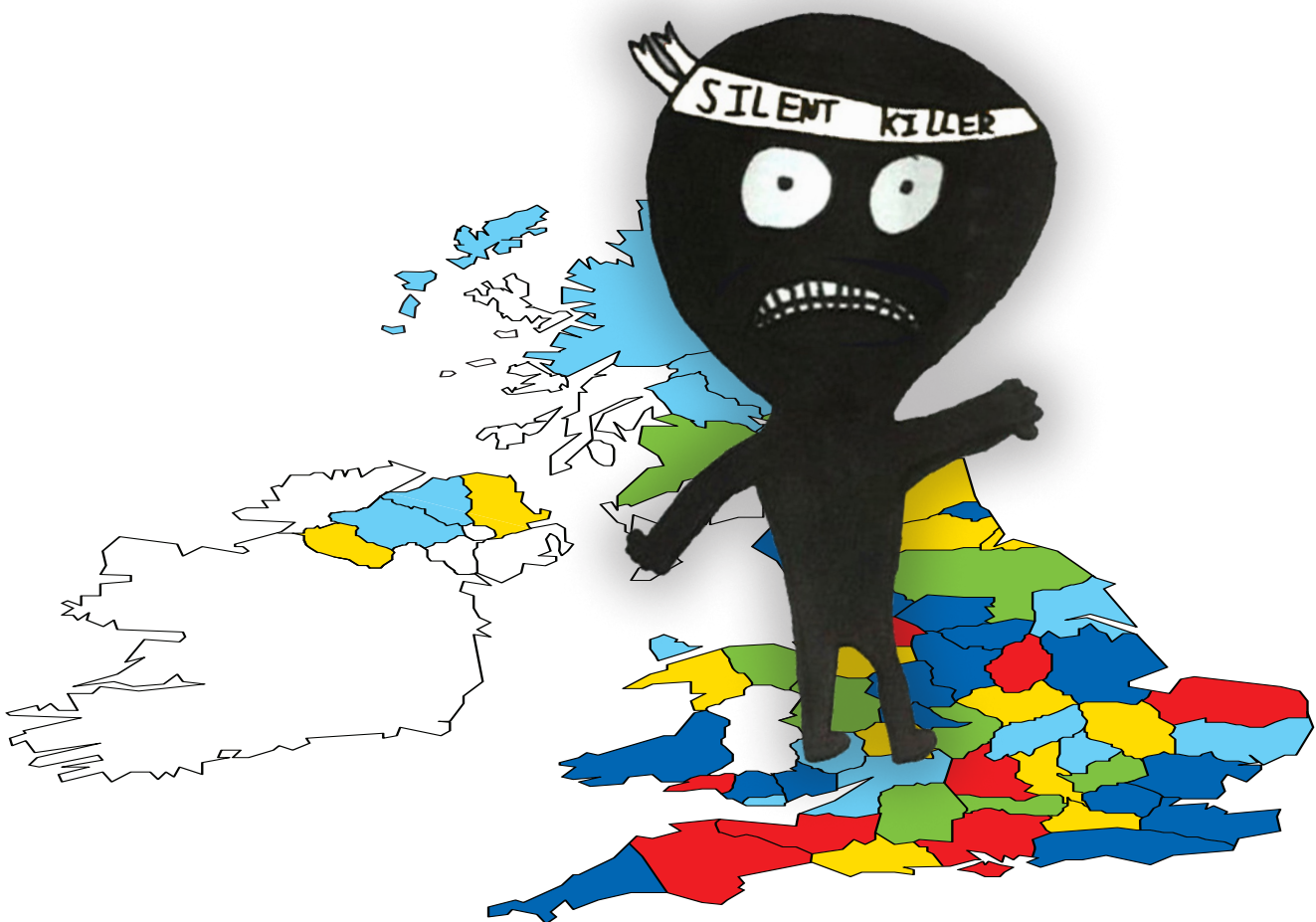




# CO-Gas Safety's Prize Giving charity tea at the House of Lords

Kindly sponsored by Scotia Gas Networks  
&  
17 Years of Data of Deaths and Injuries  
from Unintentional Carbon Monoxide Poisoning  
01.09.1995 – 31.08.2012



Make sure **YOUR** child is **SAFE** by asking your child's school to enter  
**CO-GAS SAFETY'S SCHOOL POSTER COMPETITION.**

Closing date for entries 31<sup>st</sup> July 2013  
(i.e. end of July every year)

Help us to stop these unnecessary deaths from CO and other fuel toxins

Press Pack kindly sponsored by  
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# CARBON MONOXIDE



BEWARE THE  
SILENT KILLER!

Winner for the North of England. Rhys Michael Carley-Jones. Age at entry 11  
School: Abbey Gates Primary School  
Teacher: Paul Summers



## CO-Gas Safety's 17 years of data on deaths and injuries from Unintentional Carbon Monoxide poisoning 01.09.95 – 31.08.2012 & Schools Poster Competition

### Press Pack 2013

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The Carbon Monoxide & Gas Safety Society (CO-Gas Safety) is an independent charity committed to reducing accidents from Carbon Monoxide and other gas dangers worldwide and supporting gas related accident victims.  
Company Limited by Guarantee,  
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Charity Registration No. 1048370

## Summary

1995-2013 are 18 long years. Who would have thought it would take so long? There is still so much that hasn't changed. I have run the charity as a full time volunteer since its launch in 1995, aided by other voluntary directors, mainly victims. I pay tribute to their amazing selfless work. I know the victims who help us don't want to do this. Reliving their loss is utter misery for them. I know that I also I don't want to do this. So far we have recorded 643 deaths and 4,428 people who have suffered from near misses, see page 12. We know there are many, many more that were never recorded as CO cases. People are still out there, struggling to get through the day, being told they are imagining their illness, yet they are being poisoned and are at risk of dying.

However, there is some very good news; deaths seem to be greatly reduced this year, especially mains gas related CO deaths. This is brilliant news and reflects efforts made particularly by the gas emergency service providers, for which they deserve to be congratulated. Perhaps the All Party Parliamentary Carbon Monoxide Group led by Baroness Finlay, Barry Sheerman MP and Jason McCartney MP has made a real difference? However, there have still been preventable CO tragedies. Six year old Isobel Harris died from CO in her family's tent at a campsite on 8<sup>th</sup> to 9<sup>th</sup> April 2012 (Easter) and 14 year old Hannah Thomas-Jones died from CO from a BBQ in family tent on 6<sup>th</sup> May 2012 on another bank holiday.

Our data was validated in 2012 by Dr. C. Craggs, who was kindly paid for by the Gas Safe Charity (see page 9). However, although her report vindicated our data and has not been criticized, sadly the Gas Safe Charity has not yet provided funding for our data to continue. The Gas Safety Trust has £4 million and the Gas Safe Charity £1.6 million. We have no funding to continue our data.

At the start in 1995 we were largely ignored. However, most victims were keen to talk to us and very quickly we found that most said, 'I didn't even know what CO was so how could I have prevented my loved one from dying from it?' We also found that most victims wanted to stop others suffering as they had. Some victims even joined us as directors. In other words, by just trying to help, we had found a rich research resource (which is still largely ignored).

Matthew Nixon aged 22, was a registered gas installer. He died in December 2010 from CO emitted from a petrol generator used indoors to power his tools. He had been apprenticed in the gas industry since the age of 16. His inquest is being held on the 21<sup>st</sup> and 22<sup>nd</sup> January 2013. From this death we have learned that there is no agreed material for teaching aspiring registered gas installers about CO. We have been helped hugely by retired British Gas employee Roland Johns, who has kindly worked (using our power point presentation as a basis) to provide material for the training establishments of aspiring registered gas installers. Roland's past colleague Dave Williams very kindly checked this work. Let us hope that some good will come out of this tragic death. Please see [http://www.co-gassafety.co.uk/trainers\\_of\\_gas\\_installers.html](http://www.co-gassafety.co.uk/trainers_of_gas_installers.html) for the teaching material.

Less than 2% of CO can kill in between one and three minutes. CO cannot be sensed using human senses. There are still no prime time TV warnings for CO although lots of shocking ones about things we do know are dangerous, such as fire, smoking, drink driving and eating the wrong food. The gas emergency service still has no equipment to test gas appliances for CO. Unless and until the source of CO is found, how can anyone be safe? Recommendations were made by the Health & Safety Commission (now Executive) to plug these gaps in 2000, but never implemented, see page 22. Why not? Why are the extremely wealthy fuel suppliers and manufacturers doing so little?

We see the opportunity presented by tabling amendments to the Energy Bill as our best hope for change. We are delighted that, as a result of the work done by CO+SAVi, (sub-group to the All Fuels Forum) there are some agreed changes, based on what CO-Gas Safety has lobbied for since 1995, (see pages 22-27). We have been told that David Kidney, chair of the All Fuels Forum is submitting amendments to those MPs, who are sitting on the Committee for the Energy Bill in the Commons.



## The Facts about Carbon Monoxide (CO) and Other Fuel Toxins

CO may be emitted from any faulty cooking or heating appliance powered by any fuel that burns (gas, coal, oil, wood etc.). If there is sufficient air at the flame, carbon dioxide (CO<sub>2</sub>) is produced, not CO. CO<sub>2</sub> is a greenhouse gas but CO is lethal because less than 2% can kill in between one and three minutes (see page 26 Table 23 at <http://www.hse.gov.uk/foi/internalops/hid/spc/spctosd30-annex.pdf> )

CO is lethal because the haemoglobin in the blood takes up CO in preference to oxygen. (Please note that whereas CO<sub>2</sub> has two molecules of oxygen to one of carbon, CO has only one molecule of oxygen to one of carbon.)

Research commissioned from University College London, published in a press release dated 02.10.06 by HSE, to inform its gas safety review highlights the dangers of CO poisoning in people's homes, coupled with a lack of public awareness of the risks. The early findings of the research include:

- 23% of homes had one or more defective gas appliance;
- 8% of homes were judged to be at risk of dangerous levels of CO;

(If there are 21.6 million households (please see 2009-10 English Housing Survey at <http://www.communities.gov.uk/publications/corporate/statistics/ehs200910headlinereport>) with 2.4 people in each household there are therefore 5, 840,000 people and 8% of them are 4,147,200. Call this 4 million people – be conservative and call it 3-4 million in the UK).

- 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 (young, old, those in receipt of benefits).

Further research with similar findings has been undertaken by John Moore's university [http://ljmu.ac.uk/NewsUpdate/index\\_123350.htm](http://ljmu.ac.uk/NewsUpdate/index_123350.htm) - published 2012. More than 27,000 properties were visited.

Human senses cannot pick up CO, which is another reason it is so dangerous. Sometimes other products of combustion also escape, which do smell but not necessarily. People can describe this as a 'gassy' smell.

Please note that the Gas Emergency Service basically 'makes safe' from gas or CO. They ask the consumer to turn everything off and open the windows. They then visit and if necessary, turn the appliance or the gas off in that property. **The real scandal is that the Gas Emergency Service has no equipment to test appliances for CO. However, the CO could be coming from an unsuspected appliance or from another house or flat. CO-Gas Safety has come across several such cases and one fatality (Mills case) which in the opinion of CO-Gas Safety, would have been avoided if the Gas Emergency Service had carried and used such equipment.**

It seems that, from a consumer's point of view, when a normal householder calls the Emergency Service Provider (ESP) and there is or could be CO, the duty of the ESP under the 1998 Regulations is limited to advising that person of the immediate action to be taken to prevent such escape or emission and the need for the examination and, where necessary, repair of the fitting by a competent person, (i.e. someone registered with the Gas Safe Register).

**So in effect re CO, there is no emergency service, merely a pep talk.**

**In 2000, thirteen years ago, the Health and Safety Commission (now Executive) recommended that the GES has and uses equipment to test appliances for CO but Government has failed to implement this excellent HSC recommendation.**

**The only light is the action taken by some of the Gas Emergency Service providers who now at least fit their employees with Personal Alarm Monitors for CO. Scotia Gas has led the way and we are extremely grateful. See page 29.**

**In 2000, thirteen years ago, the Health & Safety Commission (now Executive) also recommended a levy on the gas suppliers (we would prefer the whole fuel industry) to pay for publicity about the dangers of CO and for research.**

Again this excellent HSC recommendation has not been implemented. Why pay for the HSE if Government just ignores it? Also, why ignore it? Surely even on economic terms it would pay to deal with this issue? See our cost benefit analysis on page 25.

CO dissipates in a live body very quickly so a person needs to seek an urgent blood or breath test. If this is negative, it is not wise to assume that your home or workplace or car etc. is safe from CO and this is why **tests of appliances and air in a house are urgently needed to ensure safety**. Please note that CO can be emitted from next door (e.g. through a joint chimney or roof space) or another flat. Dominic Rodgers, aged 10 died from CO from next door in 2004. In 2007, Esmay Ighodalo aged 27 died from CO emitted from a mains gas central heating boiler in another flat.

Investigations can be undertaken by CORGI Services but cost at least £1,800-£3000. If CO is suspected and if a legal action is contemplated, it is vital that this investigation is undertaken before any suspected appliances are worked on (other than to turn them off). Working on an appliance will change the evidence you may wish to rely on. Landlords and installers are well aware of this and often undertake work very quickly. Please note that in our considerable experience most Gas Safe Registered installers will not undertake this test and provide the parts per million of CO to the person affected. Without this, GPs don't take CO seriously (see page 26). A course, CMDDAI, is now being taught but will it cost too much?

See **WHO guidelines for indoor air quality: selected pollutants 15.12.10**

[http://www.euro.who.int/\\_data/assets/pdf\\_file/0009/128169/e94535.pdf](http://www.euro.who.int/_data/assets/pdf_file/0009/128169/e94535.pdf)

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See page 70 second para from the bottom.

Walker (130) states that the incidence of chronic carbon monoxide exposure in Great Britain is officially 200 per year, while at the same time "250 000 gas appliances are condemned annually". He speculates that if only 10% of these appliances give off significant amounts of carbon monoxide that reach the breathing space of residents, as many as 25,000 people every year may be exposed to carbon monoxide in their homes. The carbon monoxide support study (89) found that "only one case out of 77 was correctly identified (i.e. diagnosed) on the basis of symptoms alone" and that medical professionals were the least likely group to "discover" the fact of the carbon monoxide poisoning.

See also page 86

## **Guidelines**

### **The 24-hour guideline**

Chronic carbon monoxide exposure is different from acute exposure in several important respects, as noted above. Thus, a separate guideline is needed to address minimal exposure over 24 hours, rather than the 8-hour period used in the acute guidelines. The latest studies available to us in 2009, especially those epidemiological studies using very large databases and thus producing extremely high-resolution findings, suggest that the appropriate level for carbon monoxide in order to minimize health effects must be positioned below the 8-hour guideline of 10.5 mg/m<sup>3</sup>, possibly as low as 4.6–5.8 mg/m<sup>3</sup>. This is also essential since the minimal exposure time for this guideline is three times longer.

'Note to explain these levels

10.5 mg/m<sup>3</sup> = 8.9 Parts Per Million so call it 9 PPM

4.6 mg/m<sup>3</sup> = about 4 PPM'

Please note that Colin Breed MP tabled an EDM (Early Day Motion) asking for these recommendations to be implemented in 2000 and again in 2007. The first was signed by 49 MPs and the second was signed by 121 MPs (see website [http://www.co-gassafety.co.uk/early\\_day\\_motions.html](http://www.co-gassafety.co.uk/early_day_motions.html)).

121 MPs is a huge number for an EDM, so why did it apparently have no effect?

### **Please note that there are other toxins in fuels and emissions from fuels.**

#### **Other fuel toxins**

I. Evidence from the Internet

[www.airquality.co.uk/archive/reports/cat08/0407081208\\_Task7\\_cumbustion\\_report\\_issue1.pdf](http://www.airquality.co.uk/archive/reports/cat08/0407081208_Task7_cumbustion_report_issue1.pdf)

This is a DEFRA document (i.e. a British Government document) search for NoX, PM10s, Dioxins, Furans and PCBs and VOCs (Volatile Organic Compounds).

For natural gas see <http://www.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf> and search for mercury, manganese, copper, arsenic, chromium, cadmium, barium, nickel etc. and see

[http://www.npi.gov.au/publications/aedmanuals/pubs/gasburning\\_ff.pdf](http://www.npi.gov.au/publications/aedmanuals/pubs/gasburning_ff.pdf)

For details of other toxins found in Domestic Heating Oil or fuel oil (Kerosene) combustion see <http://www.epa.gov/ttn/chief/ap42/ch01/final/c01s03.pdf>

This is from the United States Environmental Protection Agency.

For coal and wood see [http://www.npi.gov.au/publications/aedmanuals/pubs/solidfuel\\_rev2.pdf](http://www.npi.gov.au/publications/aedmanuals/pubs/solidfuel_rev2.pdf)

This is an Australian document.

For diesel see <http://www.ncbi.nlm.nih.gov/pubmed/1383162>

For mercury in oceans from deposits from power stations see <http://www.ens-newswire.com/ens/may2009/2009-05-04-02.asp>

If fish in the Pacific are being poisoned by the mercury in the pollution from coal powered power stations in Asia, think what that mercury could be doing if it is leaking with the products of combustion from a fuel appliance into a home in a confined space. Surely there should be research into this danger?

See <http://www.epa.gov/iaq/combust.html> "Particles, released when fuels are incompletely burned, can lodge in the lungs and irritate or damage lung tissue. A number of pollutants, including radon and benzo(a)pyrene, both of which can cause cancer, attach to small particles that are inhaled and then carried deep into the lung."

2. The Reach Legislation, which basically requires all products to have to be proved to be safe, excludes fuels. See

<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:396:0001:0849:EN:PDF>

3. The fact that a test house assures us that the toxins (such as mercury, manganese etc.) are in such tiny amounts that they cannot possibly cause a problem, yet state that they have done no research to prove this nor can they quote any research done to prove this. All gas appliances are tested before sale for the CE Mark but they are tested with laboratory gasses, which are specially prepared to remove impurities such as the other toxins.

4. At the All Party Parliamentary Gas Safety Group (APPGSG) meetings, although the other toxins were discussed, none of the energy companies present denied that they existed.

5. The statement from Dr. Ed Walker in the APPGSG that the other toxic compounds may well be responsible for some of the long-term consequences – see Page 19 of the report January 2009 see

[http://www.gassafetygroup.org.uk/lib/docs/allpartygassafetygroupreport\\_medicalawareness.pdf](http://www.gassafetygroup.org.uk/lib/docs/allpartygassafetygroupreport_medicalawareness.pdf)

(This is no longer available so follows) 'Treatment for the long-term effects of CO exposure is, according to Dr Ed Walker is much more complicated. The picture is complicated by the fact that victims exposed to CO are often exposed to other toxic compounds at the same time, and it may be these that are responsible for some of the long-term consequences. However survivors of severe episodes of exposure often have extensive brain damage which can be demonstrated on MRI scans of the brain. This sort of damage is permanent and irreversible.'

6. We have many other cases over the years in which toxicologists cannot explain damage suffered as resulting from CO, yet that is consistent with damage as a result of the toxins.

7. There is a case of a three year old, who died with a gas appliance in his bedroom, who had insufficient CO in his blood to kill him (in fact zero CO which is unusual). However, Stephanie Trotter, OBE was told by the Coroner, that the child had raised levels of toxins (arsenic, barium and nickel and especially manganese – 15 times the higher levels). The inquest has now been held (April 2010) and the verdict was death by natural causes. The manganese was explained by contamination and post mortem distribution, although we have been told that there is only research on post mortem distribution with regard to drugs, not heavy metals.

....

Please note that although we informed the All Party Parliamentary Gas Safety Group about the other toxins in April 2008, the group has refused to examine the other toxins confining their inquiry to CO only. However, as we submitted to the APPGSG, if poisons in water were being considered, and if toxins A,B,C and D were known to exist in water, surely it would be pointless and dangerous to consider only toxin A? Yet this in effect, is what the APPGSG continued to do. It has now renamed itself the 'All Party Parliamentary Carbon Monoxide Group' or APPCOG.

Furthermore, there is a case of poisoning by an oil fired appliance where, having not been worked on, it was tested and found to have negligible CO emissions, yet the couple report they have been badly poisoned by the other toxins.



Please also note that it is extremely difficult for our victims to obtain the services of toxicologists to assist them in any way. The only toxicologists who have been at all helpful seem to have emigrated (e.g. Dr. Alison Jones who was head of Guys Toxicology unit) or retired or undertake research work only. Stephanie Trotter, OBE has tried very hard to obtain the name of a toxicologist to advise on the poisoning of foetuses, but it seems that there is nobody in the UK who can do this or if there is, they are unwilling to assist.

### Proposed research

CO-Gas Safety wants research into:-

1. What is in gas before and after combustion?  
Is it possible for significant amounts of toxins to be emitted into the atmosphere or far worse, blown back into or remaining in a dwelling when there is a partially blocked flue? Would incomplete combustion affect this other than to increase CO? What about flueless appliances such as cookers and some fires? To undertake this research an independent body would have to be found to test the gas before combustion and after combustion using gas in pipes and burned in a boiler with a flue, a boiler with a partially blocked flue. This would also have to be done for a gas fire and also for a cooker in an average kitchen with average ventilation. Also a flueless gas fire should be tested. In 2009 we asked BRE (Building Research Establishment) about the cost of this research and it would cost about £10,000 for an initial laboratory test and a further £40,000 for field tests.
2. It is also possible that while the amounts of the toxins in fuels are small, these could build up in the body fat of the person concerned causing problems over a long period. It is well known to toxicologists that this can occur with regard to heavy metals.
3. The same as above for oil, coal and wood.  
The cost of this research would be far more than we could afford but surely the gas and oil industry must have undertaken such research? If not, why not? **Surely if they are selling their products to the public they should know what is in it and whether if used correctly or incorrectly, there are any dangers to the public?** We need this research to be of the highest quality and extremely independent. We have already asked Lord McKenzie (who at the time was a Government Minister responsible for the Health and Safety Executive, which covers gas) to undertake this research (May 2009) and also drawn the attention of various Select Committees to this need. Please note that there may be a risk to those inside from these toxins when the fumes are not exiting to outside air. However, there is also a possible risk of planet poisoning when the toxins exit to the outside air and it seems that scientists expert in outdoor air are well aware of these toxins in the atmosphere. However, the amount of such toxins would obviously be much more concentrated in indoor air.

We suspect that many people whom GPs report as 'TAT' (Tired All the Time) are in fact suffering from poisoning caused by these toxins and/or Volatile Organic Compounds (VOCs). For blood tests for these toxins see <http://www.co-gassafety.co.uk/prevention.html> and click on 'Blood tests' on the right hand side. These blood tests can be done weeks or months later, unlike tests for CO. It is also possible to have urine tests both before and after a provoker has been taken. However, it would still be necessary to prove on a balance of probabilities (for a civil claim) that these toxins, if found in the blood, came from the fuel and appliance concerned. However, if the research really has not been done by the fuel suppliers, surely urgent research on the other toxins emitted by appliances should be undertaken?

Who knows what other conditions might be being caused or exacerbated by these other toxins? For example, ME, CFS, MS, heart disease, diabetes (caused in third world countries by arsenic in the drinking water), respiratory problems and even perhaps Alzheimer's disease?

## How to prevent deaths and injuries from CO and other fuel toxins.

1. All appliances powered by any fuel that burns should be installed and serviced according to manufacturer's instructions – usually once a year.  
Make sure that the person doing this work is properly qualified. Please check and remember it's your money and your life. With gas the installer must be Gas Safe Registered. However, also check with the Gas Safe Registered website to make sure that the particular person who works on your appliance is qualified to do so (e.g. qualified for fires, not just boilers). This can be done by checking the Gas Safe Register on the Internet or by telephone.
2. Make sure all chimneys and flues are regularly swept and checked.
3. Ensure adequate ventilation and don't block ventilation grilles.
4. As an extra safeguard against CO, buy a CO alarm to European Standards EN50291. This will cost around £15 - £20 in most good DIY stores and some supermarkets.
5. Never use a barbecue inside a tent or confined space even if you think the barbecue may have gone out.

In an emergency, ring the Gas Emergency Service line on 0800111999 but they will only turn off your appliance or your gas. **They will not test your appliances for CO. They may be able to check the air you breathe but you will have been told to turn off all the appliances and open the windows before they arrived. Most fire brigades will usually attend and check for CO in the air. This will not necessarily inform you where the CO is coming from or which appliance is emitting CO, but it is very helpful and we are extremely grateful that most fire brigades will now do this.**

Seek immediate medical help and insist on a CO test and ask for the result in writing. Ordinary blood is adequate for this – **there is NO NEED for arterial blood.**

## Background to the charity and its data collection, collation and publication

See <http://www.co-gassafety.co.uk/aboutus.html> [http://www.co-gassafety.co.uk/stats\\_and\\_analysis.html](http://www.co-gassafety.co.uk/stats_and_analysis.html)

## Sponsorship sought

We have very little funding and any funding would be much appreciated. All details of how to donate can be found on our website at <http://www.co-gassafety.co.uk>

## CO-Gas Safety's suggestions to improve safety and reduce unintentional deaths and injuries from CO and other fuel dangers

See [http://www.co-gassafety.co.uk/changes\\_to\\_save\\_lives.html](http://www.co-gassafety.co.uk/changes_to_save_lives.html)

Recently we've got together with other organisations under CO+Savi, sub-group of the All Fuels Forum sitting alongside APPCOG (the All Party Parliamentary Carbon Monoxide Group), and have produced a briefing document and suggested some amendments to the Energy Bill, which can be found on pages 22-25.

## **Validation of CO-Gas Safety's data**

During the Winter and Spring of 2011 Dr. Craggs undertook a review of CO-Gas Safety's data. This was kindly paid for by the Gas Safe Charity. Stephanie and Jo Richards thoroughly enjoyed working with Dr. Craggs and consider that the standard of the data will be greatly enhanced by this work, once secure funding is obtained and the new database set up.

The first three overall conclusions by Dr. Craggs were:

**The small but dedicated CO-Gas Safety team must be given full credit for successfully creating a good quality set of raw data compiled over a period of 17 years.** This is particularly admirable as they have had extremely limited resources.

**A process flow indicated the complexity of the systems used. However, the reliability of the present paper filing system was excellent.** To simplify the filing, moving some filing from paper to electronic should be considered.

**The quality of the raw data collected by CO-Gas Safety was good.** The information collected on deaths is valid and reliable though clearly an under-estimate for total deaths. The Near Misses are slightly less reliable as the primary source is from newspaper reports and by the nature of Near Misses there are fewer opportunities to reliably follow-up these reports. It is recognised and accepted by all that the summary statistics produced by CO-Gas Safety are under-estimates of the actual numbers of victims and, for this reason, careful interpretation of CO-Gas Safety statistics is needed.

### Note by Stephanie

We have always accepted that even the deaths we record are the tip of an iceberg. There is no automatic testing of dead bodies for CO on death, even when death is unexplained. There is no coronial system in Scotland which, in our opinion means a gross under reporting of CO deaths there.

**Please note that CO-Gas Safety's data is the only data on CO that has been validated by a statistician.**

Please also note that Straight Statistics commented favourably on our data see [http://www.co-gassafety.co.uk/downloads/Jan\\_2012/Press%20Pack%202012%20final%20from%20Kadee.pdf](http://www.co-gassafety.co.uk/downloads/Jan_2012/Press%20Pack%202012%20final%20from%20Kadee.pdf) at pages 23-35

## **DR CAROLYN CRAGGS**

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Lean Six Sigma, Operational Excellence and Quality Compliance  
Secretary of Quality Improvement Section, Royal Statistical Society  
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Successful trainer with ability to develop training strategies

### **Qualifications**

1993- to date	Chartered Statistician
1980	PhD in Applied Statistics, University of Newcastle upon Tyne
1976	BSc(Hons) Statistics (First Class), University of Newcastle upon Tyne
1976 – to date	Fellow of Royal Statistical Society

### **Training**

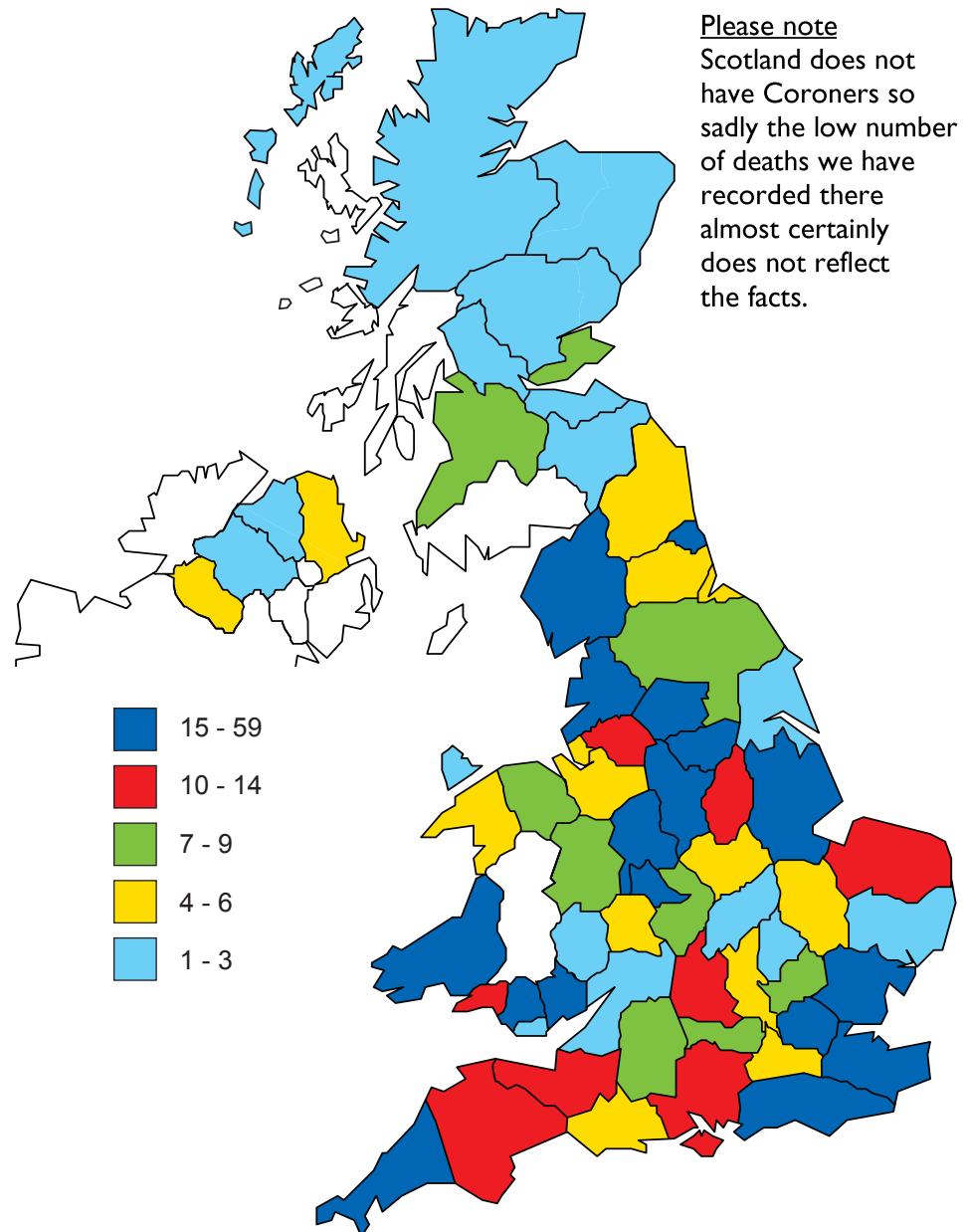
- Training statistical & Six Sigma (Green, Black & Master Black Belt) courses including software e.g. MINITAB, SPSS
- Developing training programmes aligned to business needs
- Training courses presently available include: a range of Refresher Statistics courses, Six Sigma Black Belt Training, Analysis of Variance, Multivariate Analysis,.

### **Employment Record**

2007- to date	Director – Carolyn Craggs Statistician Limited (CCSL)
1999-2007	Principal Statistician in Operational Excellence, GlaxoSmithKline plc based at Barnard Castle; in addition Lean Six Sigma Expert
1998-1999	Director of Programmes (courses), School of Computing and Mathematics, University of Northumbria at Newcastle, UK
1989-1998	Head of Statistics Division and Principal Lecturer in Statistics, School of Mathematics, University of Northumbria at Newcastle, UK
1985-1989	Senior Lecturer in Statistics, University of Northumbria
1983-1985	Lecturer II in Applied Statistics, Sheffield City Polytechnic, UK
1979-1983	Lecturer in Statistics, The University, Hull

# UK Deaths from unintentional carbon monoxide poisoning from 01.09.95 to 31.08.2012

(This data is being added to and checked all the time so may change)



CO-Gas Safety receives information about deaths from media, families, Coroners and other organizations, such as the Solid Fuel Association and HSE. CO-Gas Safety writes to every Coroner concerned to check each death and most are very helpful.



## Deaths listed by area

England	508
Wales	91
Scotland	26
N. Ireland	16
Unknown	2
<b>TOTAL</b>	<b>643</b>

### ENGLAND

London	59
South Yorkshire	31
Derbyshire	26
Kent	23
West Yorkshire	22
Lancashire	20
Staffordshire	19
West Midlands	18
Cornwall	17
Essex	17
Lincolnshire	16
Tyne & Wear	15
Sussex	15
Cumbria	15
Somerset	14
Greater Manchester	13
Norfolk	13
Nottinghamshire	11
Hampshire	11
Devon	10
Oxfordshire	10
North Yorkshire	9
Wiltshire	9
Shropshire	7
Berkshire	7
Hertfordshire	7
Warwickshire	7
Leicestershire	6
Merseyside	6
Northumberland	5
Buckinghamshire	5
Cambridgeshire	5
Cleveland	5
Cheshire	4
Surrey	4
Worcestershire	4
Dorset	4
Durham	4
Gloucestershire	3
Northamptonshire	3
Suffolk	3
Bedfordshire	2
East Yorkshire	2
Herefordshire	2

### WALES

Dyfed	25
Gwent	18
Mid Glamorgan	18
West Glamorgan	13
Clwyd	9
Gwynedd	4
South Glamorgan	3
Angelsey Isle of	1

### NORTHERN IRELAND

Co. Antrim	6
Co. Fermanagh	4
County Tyrone	3
Londonderry	2
Northern Ireland	1
Unknown	2

### SCOTLAND

Fife	7
Strathclyde	8
Lothian	3
Stirlingshire	2
Aberdeenshire	2
Highland	1
Outer Hebrides	1
Scottish Borders	1
Tayside	1

## CO-GAS SAFETY'S STATISTICS OF DEATHS AND INJURIES\*

UK deaths caused by accidental Carbon Monoxide (CO) poisoning

(Between 1 Sept 1995 - 31 Aug 2012): **Total: 643**

TENURE	
Total Number of CO accidental deaths by Tenure: (1 Sept 95 – 31 Aug 2012):	
Owner/Occupier	375
Private Rental	66
Council	61
Housing Association	21
Other (e.g. hotel)	9
Unknown	111

SITUATION					
Total Number of CO accidental deaths by Situation (1 Sept 1995 – 31 Aug 2012):					
House	311	Campervan	11	Public House	4
Flat	93	Lorry	8	Shop	4
Bungalow	42	Shed/Cabin	7	Public Hall	2
Caravan	24	Car	5	Tent	2
Boat	23	Hotel	5	Care Home	1
Garage	22	Workshop	5	Other	21
Work Place	13	Commercial Premises	4	Unknown	36

FUEL TYPE																		
Total Number of CO accidental deaths by Fuel breakdown and CO-Gas year (1 Sept to 31 Aug):																		
Year	95/6	96/7	97/8	98/9	99/00	00/1	01/2	02/3	03/4	04/5	05/6	06/7	07/8	08/9	09/10	10/11	11/12	Total
Solid fuel	27	19	25	14	17	14	5	8	3	5	8	14	10	6	7	7	11	200
Gas Mains	32	22	18	24	14	16	7	11	9	14	12	9	11	16	4	12	2	234
Gas Portable	8	8	6	6	10	5	7	7	6	4	7	4	3	6	5	5	0	97
Petrol/ Diesel	6	7	3	6	3	3	8	1	2	3	2	9	5	4	6	6	1	75
Oil	0	2	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	5
Paraffin	0	0	0	1	1	0	0	0	2	0	0	0	1	0	0	0	0	5
Unknown	1	0	0	0	0	0	4	4	0	3	4	2	1	3	0	4	1	27
<b>Total</b>	<b>74</b>	<b>58</b>	<b>52</b>	<b>51</b>	<b>46</b>	<b>38</b>	<b>31</b>	<b>31</b>	<b>22</b>	<b>29</b>	<b>33</b>	<b>39</b>	<b>31</b>	<b>36</b>	<b>23</b>	<b>34</b>	<b>15</b>	<b>643</b>

### Near-Misses from Accidental Carbon Monoxide Poisoning in UK

(01 Sept 1995 - 31 Aug 2012): **Total: 4428**

More than 2188 requiring hospital treatment and of those over 379 had lost consciousness

Year	95/6	96/7	97/8	98/9	99/00	00/1	01/2	02/3	03/4	04/5	05/6	06/7	07/8	08/9	09/10	10/11	11/12
	467	449	320	386	335	296	87	145	171	213	153	329	192	263	187	155	280

### Deaths from Gas Explosion in UK (Sept 1995 to Aug 2012): **Total: 105**

Year	95/6	96/7	97/8	98/9	99/00	00/1	01/2	02/3	03/4	04/5	05/6	06/7	07/8	08/9	09/10	10/11	11/12
	11	5	6	6	13	6	6	5	15	4	4	4	5	4	4	5	2

\* Information is collected from the International Press Cuttings Bureau on a daily basis and from other sources. Coroners are contacted about all deaths. The tabulated data presented here is based on the December 2012 update. For further details please visit [www.co-gassafety.co.uk](http://www.co-gassafety.co.uk)

## CO-Gas Safety data on deaths from unintentional CO poisoning put into HSE years (1 April to 31 March)

Year	95/6	96/7	97/8	98/9	99/00	00/1	01/2	02/3	03/4	04/5	05/6	06/7	07/8	08/9	09/10	10/11	11/12	Total
Solid fuel	26	18	22	17	13	19	5	8	3	5	8	12	10	8	6	6	9	195
Gas Mains	28	22	18	23	17	18	6	12	10	13	9	10	12	14	8	12	1	233
Gas Portable	8	6	6	7	10	5	6	7	8	2	8	3	5	5	4	6	1	97
Petrol/ diesel	3	7	5	5	4	3	6	4	2	2	2	8	7	2	8	4	3	75
Oil	0	2	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	5
Paraffin	0	0	0	0	2	0	0	0	0	2	0	0	1	0	0	0	0	5
Unknown	1	0	0	0	0	0	2	6	0	3	3	3	1	3	0	3	2	27
<b>Total</b>	<b>66</b>	<b>55</b>	<b>51</b>	<b>52</b>	<b>46</b>	<b>45</b>	<b>25</b>	<b>37</b>	<b>23</b>	<b>27</b>	<b>30</b>	<b>36</b>	<b>37</b>	<b>33</b>	<b>27</b>	<b>31</b>	<b>16</b>	<b>637</b>

Please note that HSE collect statistics for domestic/commercial gas fatalities due to both LPG and Natural Gas. Workplace CO deaths recorded could (theoretically) arise from incomplete combustion of any type of fuel. In contrast, CO-Gas Safety collects statistics with regard to unintentional CO related deaths and injuries from all fuels.

## Table RIDGAS

Incidents relating to the supply and use of flammable gas (a) 2007/08 - 2011/12p

		2007/08	2008/09	2009/10	2010/11	2011/12p
Number of incidents (b)	Explosion/fire	31	27	21	36	26
	Carbon monoxide poisoning	147	172	196	229	168
	Other Exposure	12	4	6	13	8
	<b>Total</b>	<b>190</b>	<b>203</b>	<b>223</b>	<b>278</b>	<b>202</b>
Number of fatalities	Explosion/fire	2	2	1	3	1
	Carbon monoxide poisoning	13	15	9	13	3
	Other Exposure	3	1	-	1	-
	<b>Total</b>	<b>18</b>	<b>18</b>	<b>10</b>	<b>17</b>	<b>4</b>
Number of non-fatalities	Explosion/fire	37	30	27	48	35
	Carbon monoxide poisoning	191	289	292	368	289
	Other Exposure	10	5	11	12	9
	<b>Total</b>	<b>238</b>	<b>324</b>	<b>330</b>	<b>428</b>	<b>333</b>

### Notes:

p = Provisional

(a) Mainly piped gas but also includes bottled LPG.

(b) An incident can cause more than one fatality or injury

Regulation 6(1) of RIDDOR places a duty on certain conveyors of gas (including LPG), to notify HSE of an incident involving a fatal or major injury that has occurred as a result of the distribution or supply of flammable gas. The statistics published above are as reported to HSE. When a report is made under Reg 6(1), it will be at an early stage of the incident, thus the detailed circumstances of the incident will not have been confirmed.

**Comment by CO-Gas Safety:** Please note that although RIDDOR imposes a duty to notify HSE, it seems that HSE is under no specific duty to investigate. HSE always investigates if there is a fatality but, in out 17 years of experience, does not usually investigate a mere incident or injury, unless extremely serious.

## CO-Gas Safety data on deaths from unintentional CO poisoning put into Gas Safety Trust years (1 July to 30 June)

Year	95/6	96/7	97/8	98/9	99/00	00/1	01/2	02/3	03/4	04/5	05/6	06/7	07/8	08/9	09/10	10/11	11/12	Total
Solid fuel	27	18	26	13	16	15	6	8	3	5	7	13	9	9	6	6	13	200
Gas Mains	30	21	21	24	14	17	7	11	9	14	12	7	13	16	4	12	2	234
Gas Portable	8	8	5	7	10	4	8	7	6	2	8	4	4	5	4	6	1	97
Petrol/diesel	5	7	4	6	3	3	8	1	2	2	3	7	7	4	6			75
Oil	0	2	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	5
Paraffin	0	0	0	1	1	0	0	0	2	0	0	0	1	0	0	0	0	5
Unknown	1	0	0	0	0	0	3	5	0	3	4	2	1	3	0	4	1	27
<b>Total</b>	<b>71</b>	<b>56</b>	<b>56</b>	<b>51</b>	<b>44</b>	<b>39</b>	<b>32</b>	<b>32</b>	<b>22</b>	<b>26</b>	<b>34</b>	<b>33</b>	<b>36</b>	<b>38</b>	<b>21</b>	<b>32</b>	<b>20</b>	<b>643</b>

Please note. CO-Gas Safety started collecting its data on the 1st September 1995 so for 95-96, the data put into HSE year (April to March) and Gas Safety Trust year (June to July) is only partial for the time period.

### CO-Gas Safety reminds readers that our data is the only data:-

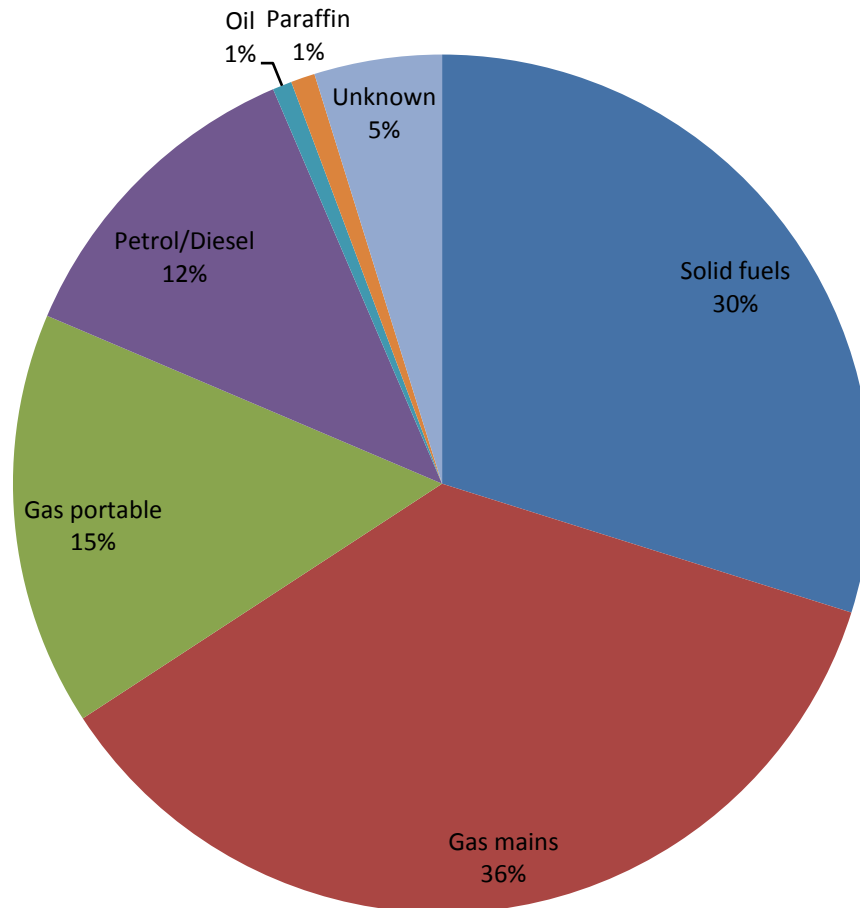
1. To be collected directly from the media and other sources with regard to all fuels.
2. Checked with the Coroner concerned, although of course we can't insist that the Coroner helps us, but most do. We have been doing this since 1995.
3. Is widely published with the names of the dead in England and Wales published on our website so anyone can check its validity re the deaths. We obviously can't publish the near misses in the same way due to confidentiality. The deaths from CO all have a public inquest in England and Wales, so they are already in the public domain.
4. Is collected, collated and published by a victim based charity, which really cares about its accuracy.
5. Has been favourably reviewed and favourably compared to the data of the Gas Safety Trust by the independent 'Straight Statistics' (see attached) headed by Nigel Hawkes, an eminent Science writer (see [http://www.cogassafety.co.uk/downloads/Jan\\_2012/Press%20Pack%202012%20final%20from%20Kadee.pdf](http://www.cogassafety.co.uk/downloads/Jan_2012/Press%20Pack%202012%20final%20from%20Kadee.pdf) page 23). We had to correct the data provided by the Gas Safety Trust in summer 2012. One of their 'barbecue deaths' was in the wrong year and was not caused by a barbecue but by a generator.
6. Is not supporting a profit for an organisation to do this.
7. And thanks to the Gas Safe Charity, is now the only data to have been validated by an independent statistician, Dr. Craggs.

However at the time of writing (January 16<sup>th</sup> 2013) we have no funding to continue this valuable work although we have applied to the Gas Safe Charity for such funding and did so in September 2010 and again in May 2011. Please note that the Gas Safety Trust and the Gas Safe Charity together have funds of £5.6 million.



## FUEL type relating to UK Deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2012.

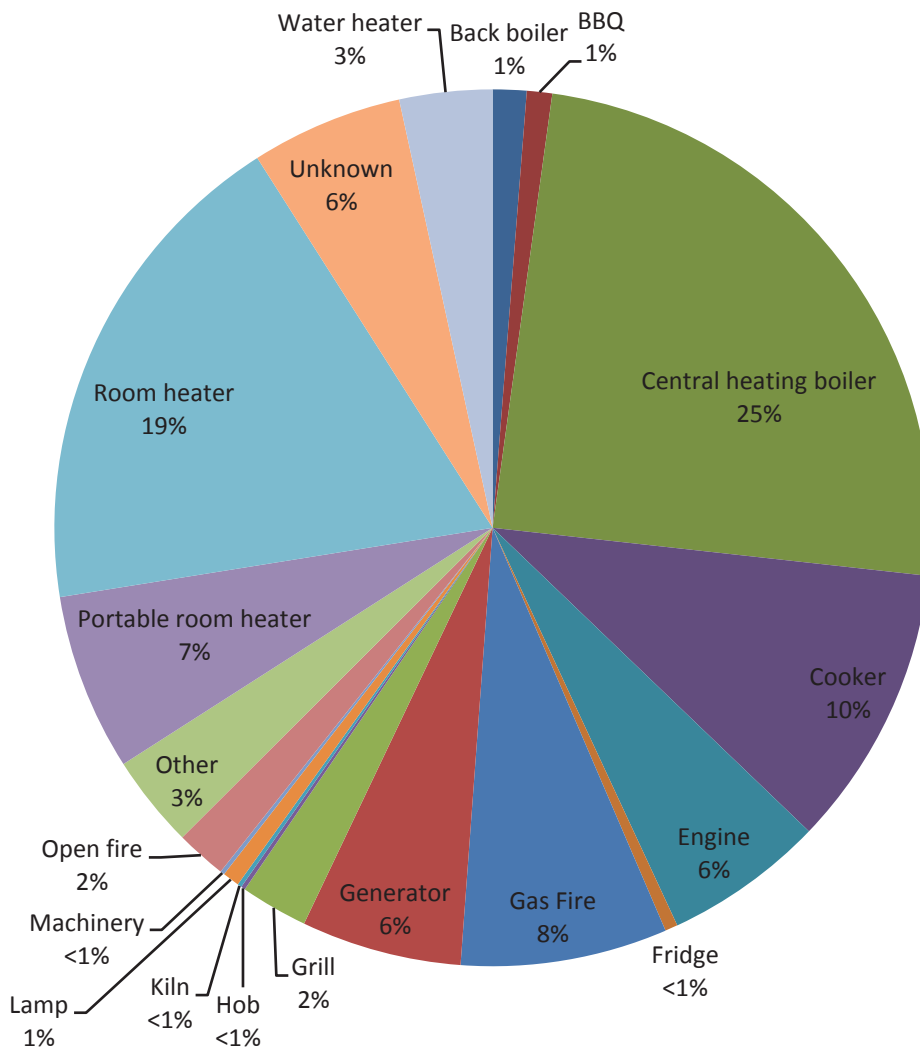
\*This data is being added to regularly so chart may change.



Considering the relatively small number of solid fuel users, there is a high incidence of deaths from solid fuel.

# APPLIANCE type relating to UK Deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2012.

\*This data is being added to regularly so chart may change.

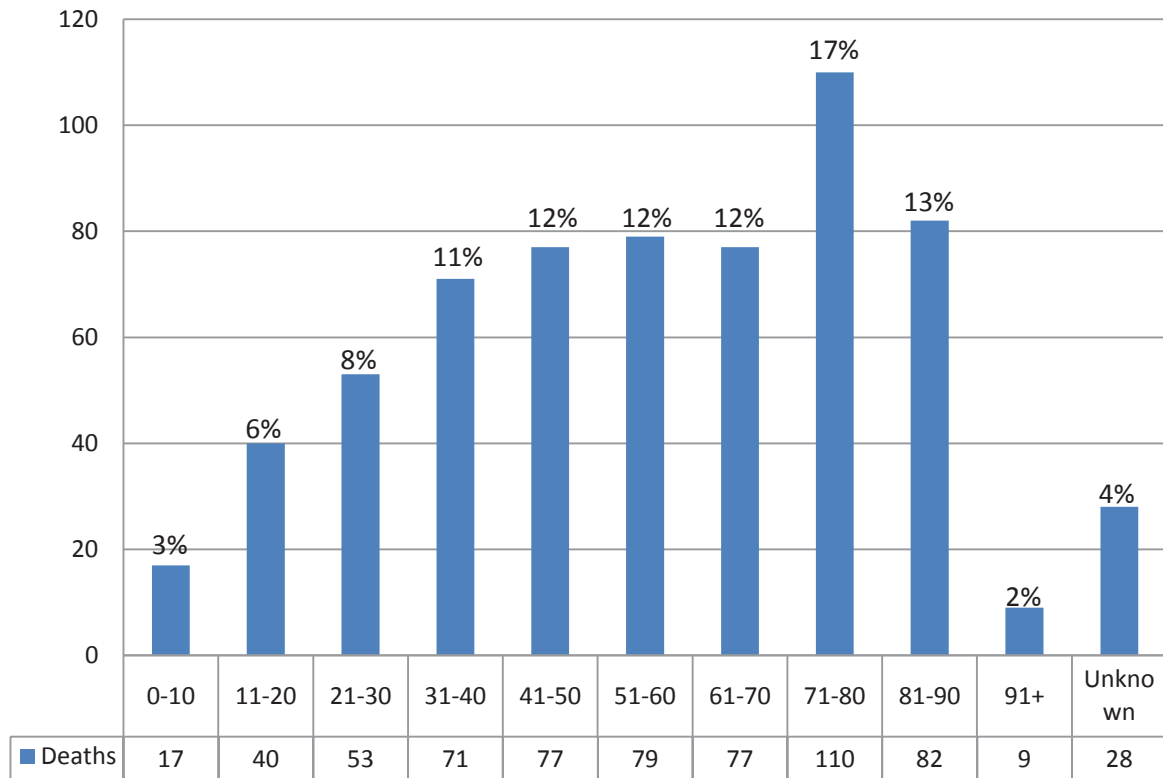


Generator is a portable machine.

'Engine' is from a car, lorry, aeroplane or boat.

## AGE of victims relating to UK Deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2012.

\*This data is being added to regularly so chart may change.



### Age Range

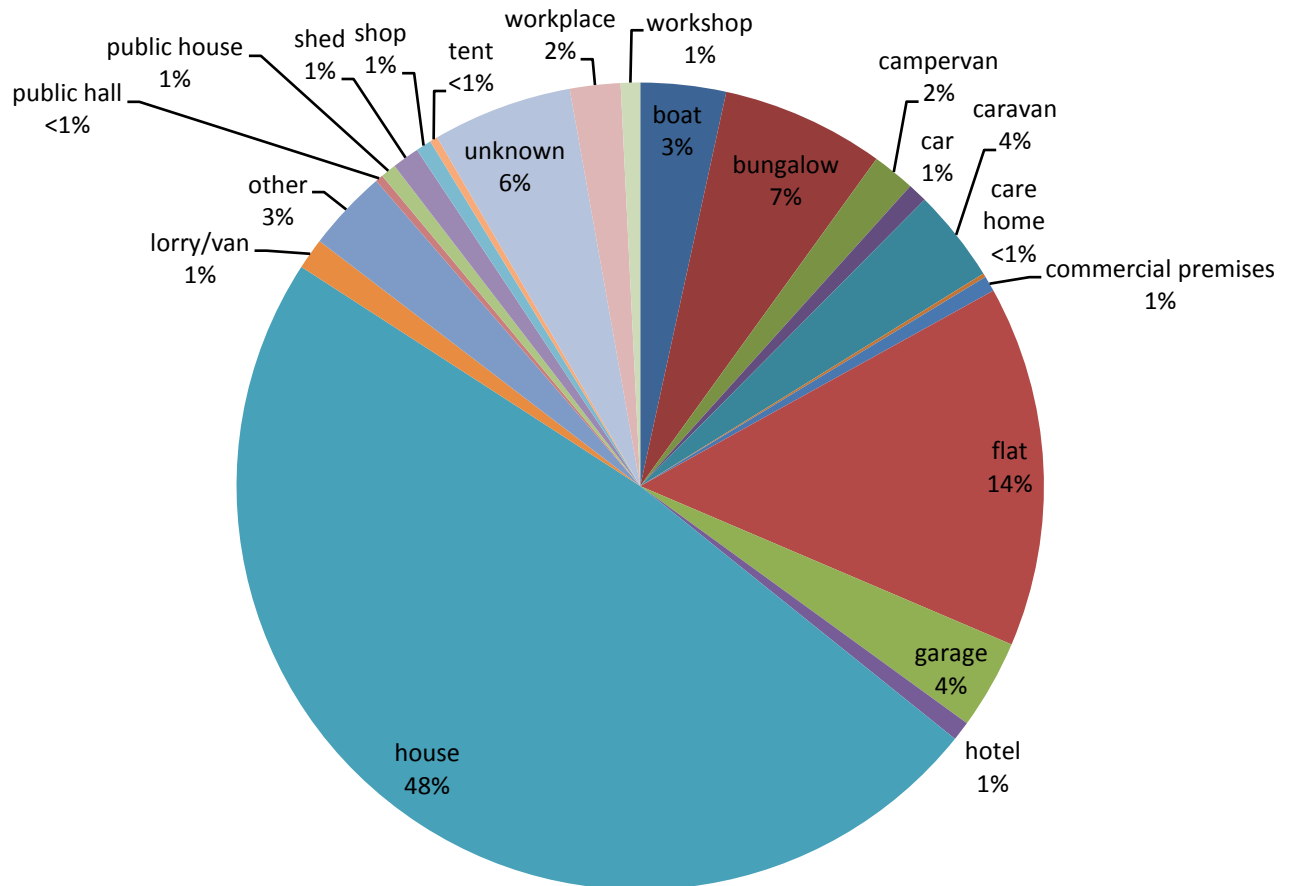
#### Census 2011

It is interesting to note that ages 70-79 make up just over 7% of the population\* yet represent around 17% of the deaths. In our opinion, many deaths in this age group may be put down to 'heart attack' when they are in fact CO, because there is no automatic test of CO on death, meaning the number of deaths in this age group could be even higher.

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

## PLACE of incident that caused death relating to UK Deaths from unintentional carbon monoxide poisoning from 01.09.1995 to 31.08.2012.

\*This data is being added to regularly so chart may change.



It is easy to see that people at home are most at risk from carbon monoxide poisoning. Why is so little being done to raise awareness of the dangers and to protect ordinary people who may be exposed for 24 hours a day?

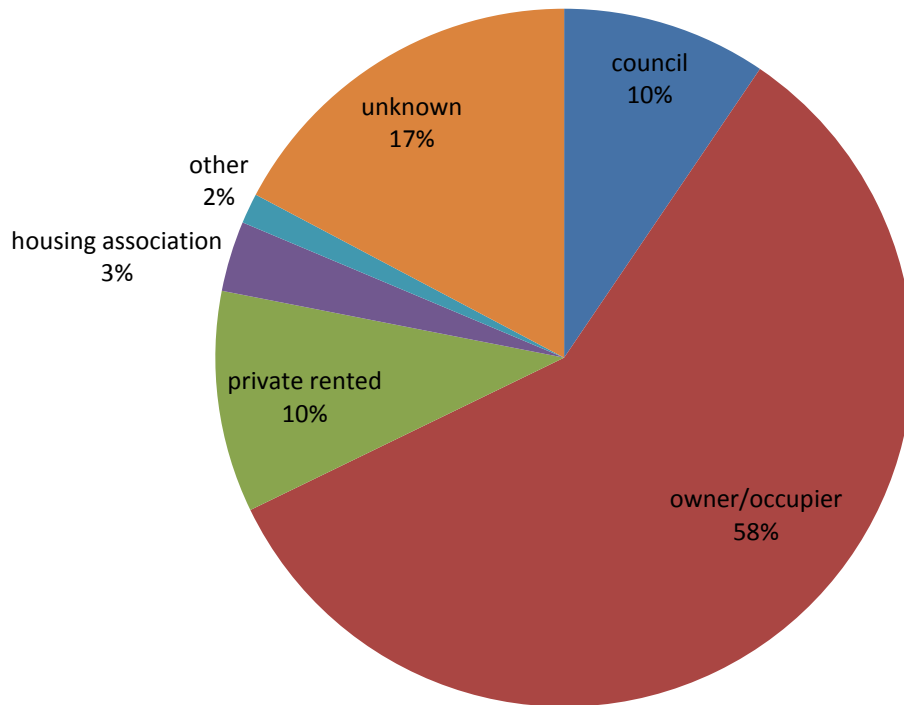
Dr. Ben Croxford's research at UCL (University College London) in 2006 found:

- 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 (young, old, 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 31.08.2012.**  
 This data is being added to regularly so chart may change.



**Tenure**

According to the Communities & Local Government Dwelling Stock Estimates England 2011:

- There were an estimated 22.8 million dwellings in England as at 31 March 2011, an increase of 0.53 per cent on the previous year.
- At March 2011 there were 18.8 million private dwellings (owner occupied plus private rented tenures) and 4.0 million social rented (housing associations plus local authority tenures).

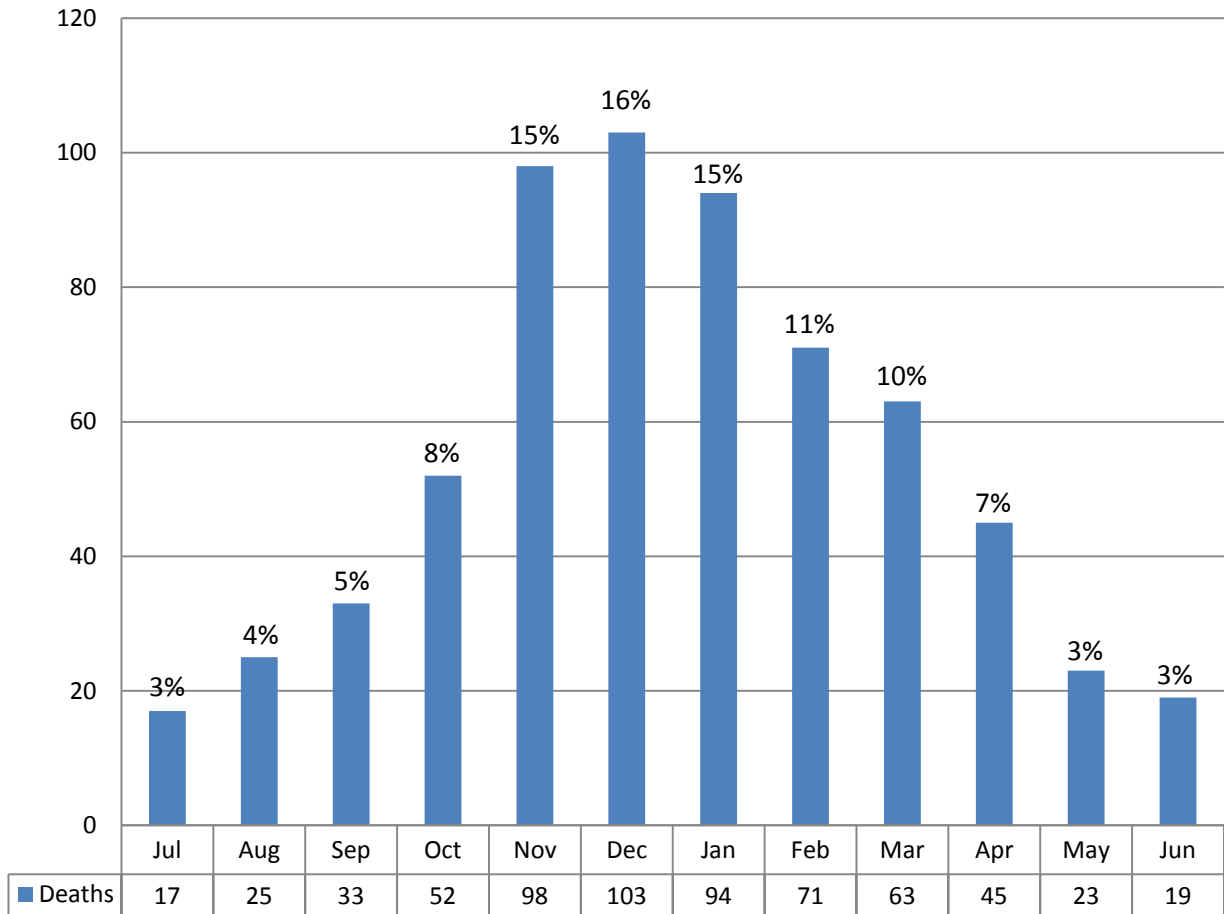
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/6868/2039750.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6868/2039750.pdf)

Comment by CO-Gas Safety

The incidence of deaths in council owned property looks relatively high (10% of the deaths against 7.5% of the housing but housing associations look quite low at 3% of the deaths as against 9.8% of the housing stock). We are unable to comment on privately rented and owner occupied separately because the figures are not available yet for 2011. However, taken together the incidence of deaths looks lower than expected at 68% of deaths while the stock is 82% although there is quite a high incidence of unknown tenure, (17%).

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 31.08.2012.**  
 This data is being added to regularly so chart may change.



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

**One example page of CO-Gas Safety's 18 pages from 01.09.95 to 31.08.2012 of the named people who have died from unintentional carbon monoxide poisoning**

<b>Surname</b>	<b>Forename</b>	<b>Age</b>	<b>DateOfDeath</b>	<b>FuelType</b>	<b>Appliance</b>
Agar	Peter	53	30/01/2001	Petrol/Diesel	Other
Ahmed	Qaila	20	16/03/1998	Mains Gas	Gas Fire
Ahmed	Tauseff	23	16/03/1998	Mains Gas	Gas Fire
Ainsworth	Derek	54	20/02/1999	LPG	Generator
Aitken	John	63	06/04/1999	Petrol/Diesel	Engine
Akester	Wilfred		02/04/1999	LPG	Fridge
Akhtar	Javed	31	23/10/1995	Mains Gas	Gas Fire Central Heating
Ali	Mohamed	33	00/04/1998	Mains Gas	Boiler
Alker	Deborah Ann	45	27/04/2004	Paraffin	Cooker
Allan	Andrew	31	25/11/1999	LPG	Room Heater Central Heating
Allen	Brian	50	27/01/2000	Mains Gas	Boiler
Allen	Daniel	19	12/02/2006	LPG	Other Central Heating
Allen	Jeffrey	47	19/09/2007	Mains Gas	Boiler
Allum	Nigel	24	30/12/2006	Petrol/Diesel	Generator Portable Room Heater
Ananthakumar	Nadorasah		15/03/2001	LPG	Heater
Anderson	Zoe	24	28/12/2110	Mains Gas	Boiler
Angell	Jean Mary	67	28/05/1998	Solid	Room Heater
Angell	Winifred Florence	95	28/05/1998	Solid	Room Heater Central Heating
Archer	Harold	74	25/11/1996	Solid	Boiler Central Heating
Arkell	Stephen	25	08/11/1995	Solid	Boiler
Atkinson	Samuel	57	22/02/1996	Petrol/Diesel	Engine
Attwood	Elsie	86	27/11/2007	Mains Gas	Gas Fire
Attwood	Ray	88	27/11/2007	Mains Gas	Gas Fire
Axford	Dorothy	65	02/02/2003	Mains Gas	Cooker
Axford	Lillian	76	07/02/2003	Mains Gas	Cooker
Ayeano	Rusel	29	18/10/2003	Petrol/Diesel	Generator Central Heating
Bailey	Mary-Ann	15	28/01/2004	Mains Gas	Boiler Central Heating
Bailey	Sarah Jane	74	14/08/2007	Oil	Boiler
Baker	John	50	03/03/1998	Solid	Room Heater Portable Room Heater
Ball	Jordan	18	21/03/2009	LPG	Heater
Barber	Rachel	85	25/03/1998	Solid	Open Fire
Barns	David	75	22/09/1998	Petrol/Diesel	Engine
Barton	Brian	59	05/02/1998	LPG	Generator
Bateman	Leslie George	87	07/02/2008	Solid	Cooker
Bates	Lena	93	04/06/1998	Solid	Room Heater

**Briefing document, for Don Foster MP, Minister for CLG, suggested changes to the Energy Bill and supporting evidence given to Don Foster MP, 18<sup>th</sup> December 2012.**

Carbon monoxide (CO) can be emitted from any faulty cooking or heating appliance powered by a carbon based fuel such as gas, petrol, oil, coal, wood etc. CO cannot be sensed using human senses. Less than 2% of CO can kill in between one and three minutes (see HSE website Para 74 Table 23 at [http://www.hse.gov.uk/foi/internalops/hid\\_circs/technical\\_osd/spc\\_tech\\_osd\\_30/spctecosd30.pdf](http://www.hse.gov.uk/foi/internalops/hid_circs/technical_osd/spc_tech_osd_30/spctecosd30.pdf))

According to DoH figures (only for England & Wales) **50 people per year have died from CO and about 4,000 people per year have been taken to A & E.**

CO-Gas Safety is an independent registered charity, run by volunteers. It was launched in 1995. We talked to victims and their families and quickly concluded that the main reason there were unintentional deaths and injuries was that people didn't even know CO existed, let alone how to prevent it. In 1995 CO-Gas Safety suggested a levy to raise awareness of the dangers of CO. We also suggested that the gas emergency service carry and use equipment to test gas appliances for CO.

The cost per year of these deaths and injuries in England & Wales alone is **£149,850,000** (see Appendix A, cost benefit analysis based on DoH figures). **Multiply this cost per year by the 18 years that have elapsed since we started to lobby for this levy and 900 people have lost their lives and the cost to the taxpayer has been £2,697,300,000 so far.**

CO-Gas Safety ([www.co-gassafety.co.uk](http://www.co-gassafety.co.uk)) has drafted the following with suggestions from the Katie Haines Memorial Trust and others such as Mark Pratten of the Fire Service and HTW (HolidayTravelWatch) and the support of the Dominic Rodgers Trust. These bodies hope that the APPCOG will put these amendments forward.

- I **A small levy on the whole fuel industry, (ideally including the manufacturers etc.) , to pay for raising awareness of carbon monoxide poisoning and other gas dangers and for the prevention of unintentional deaths and injuries from carbon monoxide poisoning and other gas dangers and for research and to be used for general improvements to fuel safety.**

The issue here is who would hold the funds and provide them. CO-Gas Safety suggests a board appointed by the committee for judicial appointments to avoid bias. We further suggest that this board should be under a duty to pay out the whole year's fund to improve gas safety by the end of the twelfth month following the receipt of the levy received in the first year and so on.

**A levy of a mere £2 per household per year would provide £44 million per year.** The green levy to be brought in by the Energy Bill is over £100 per household per year. Please note that a levy on the gas suppliers only, to raise awareness of the dangers of CO and for research was recommended by the Health & Safety Commission (now Executive) in 2000 after an exhaustive gas safety review and with support of the majority of the stakeholders, who were mainly industry. So why wasn't this implemented? We have since learned that the HSE didn't even press for legislation for this. See letter from the Cabinet office, (see letter at Appendix B). HTW suggests also charging the levy to commercial premises such as hotels, clubs, cottages etc.

This levy could then cover:-

- a. **Paying for prime time TV warnings** (via Public Information Films etc) although the Cabinet Office has responsibility to secure free air time and technical assistance from the media companies. However, the fuel industry is immensely wealthy. There needs to

be many films to cover different scenarios, e.g. all the fuels, from gas to barbecues and all the premises, from houses to tents & vehicles etc.

HTW has noted that the Cabinet Office & OFCOM are failing to comply with their own response times; HTW will be chasing this matter according to their own protocols.

- b. Raising awareness of the dangers of CO via other digital means.
- c. Developing and adopting a protocol re CO events (ideally use protocol developed by Mark Pratten of the Cornwall Fire and Rescue Prevention Team).
- d. Improving knowledge amongst GPs' surgeries and A & E departments. At the moment GPs are not good at diagnosing CO. The late Dr. John Henry sent 200 GPs symptoms of CO and although many sensible suggestions were made, not a single GP suggested CO and see recent incident in Appendix C.
- e. Improving the protocol and equipment to monitor for CO used by the Ambulance service. HTW supports use of creating a pre and during protocol which could be extended to all emergency services.
- f. Undertaking research including other toxins;
- g. Collecting, collating and publishing data.
- h. Improving training of gas installers. No agreed training material on CO for aspiring registered gas installers. Death of registered gas installer from CO in 2010.
- i. Assisting victims and their families.
- j. Encouraging the manufacture and fitting of cut off devices in appliances and heating systems so that if oxygen is reduced or CO is sensed, the appliance or system automatically shuts down.
- k. Funding other initiatives to improve gas safety generally including at risk/immediately dangerous, involving registered gas installers in gas safety, automatic testing of bodies on death, prominent warnings on barbecues, campsites and generators, work under the green deal and including CO in the home safety module of the Personal, Social and Health Education curriculum, etc.

## **2. Gas emergency service must carry and use equipment to test appliances and air for CO.**

Also recommended by HSC in 2000 with support of the majority of the stakeholders but not implemented. Legislation will be required but we appreciate that the gas emergency service will need help to do this properly and the levy is the obvious source of funding for this. Ideally records ought to be made and kept of what happens after an appliance is cut off to 'square the circle'.

## **3. Smart meters – use this opportunity to test appliances and air for CO before and after fitting the smart meter.**

The opportunity to enter all homes with gas is a once in a lifetime opportunity. This last happened with the change over from town gas to natural gas in the 1970s. Again this will need funding. If an appliance is found to be emitting huge amounts of CO before the meter is changed, the person affected, (who may have lost job, house & spouse) should be offered the opportunity to consider their position before the situation is changed.

#### **4. Change to landlords' law, The Gas Safety (Installation and Use) Regulations**

**1998 Reg. 36.** At the moment there is confusion between the landlord's duty to undertake a safety check and obtain a certificate and the continuing duty to keep the landlord's gas appliances in a safe condition.

There are different possible ways of doing this but the vital thing is to require **a service or a test for CO with equipment to test for CO**, rather than just a safety check and certificate and also a requirement to fit a **CO alarm to EN 50291** or check that an existing CO alarm has at least one year left to be in date.

**Proposed Change** 'Person undertaking the check must either undertake a service according to manufacturer's instructions or, following procedures outlined in BS7967 part 4), use a Flue Gas Analyser meeting EN50379 (or modern equivalent) to measure the combustion gasses for PPM (Parts Per Million) of CO and also the CO/CO<sub>2</sub> ratio and make and keep a record of those measurements, provided they are within the recommendations made by the manufacturer, and given to the tenant as part of the safety certificate.

If the measurements are not within the specifications made by the manufacturer, the measurements must be recorded and a written copy given to the tenant together with a notice in writing that a full service must be undertaken at the landlord's expense within 28 days. The tenant must be given an opportunity to seek advice with regard to any exposure to carbon monoxide poisoning, before a service is undertaken. Therefore the appliance must be cut off during this time. The measurements and notice must also be given to the landlord as soon as possible.

After the service is completed, a record of the service and new measurements must be made and kept and given to the tenant and the landlord as part of the safety certificate. Furthermore a CO alarm to EN 50291 must be fitted or checked to be working and in date for at least one year and a record of this made and kept and given to the tenant and landlord and specified in the safety certificate.'

#### **5. All holiday accommodation including hotels etc. to be included under the landlords' law on gas safety.**

This will have to be drafted separately because a night's stay at a hotel etc. does not constitute a tenancy with a landlord and tenant. HTW are of the view that the holiday accommodation point must be carefully defined to ensure that all private and company lets/hire/rent etc are captured by this requirement.

#### **6. Make mandatory the use of flue gas analysers (or modern equivalent) for installation, commissioning and maintenance by registered gas installers where specified by the manufacturers' instructions.**

Because condensing boilers require the use of flue gas analysis on commissioning and servicing, this is happening anyway so this change would simply update the law to be carried out by registered gas installers on modern appliances.

#### **7. N. Irish law – to be the same in England and Wales. Query Scotland which is consulting on this topic.**

This should be fairly easy to obtain. It is surely difficult to argue that while N. Ireland has this safety measure and possibly Scotland too, England and Wales will be denied it. However, this will take some years to work through as houses are built and appliances changed. Meanwhile the most dangerous appliances will continue to be threaten life and health while the public is not even warned of the existence of CO.

**8. Registered gas installers must have public liability insurance.**

These needs a change in the law to achieve this but will affect few installers (as most have PLI) so should be fairly easy to obtain. HTW wholeheartedly supports this sensible proposal.

**9. Government to consult on changing the law and bringing all fuels under the same or similar rules as gas.**

Appendix A

**Cost benefit analysis of a modest levy**

A levy would save funds or even produce surplus funds, because the cost of each sudden death is £1,565,000 and reportable\* injuries £17,900. These are HSE figures for 2010/11 see <http://www.hse.gov.uk/economics/eauappraisal.htm>

The Fuel Safety Levy, even at £2 per annum should bring in at least £44 million per year to be spent on safety improvements. There would be some costs involved in raising a levy but these are likely to be small.

DH statistics released Autumn 2011 are 50 deaths and 4,000 to A & E each year in England and Wales See <http://gp.dh.gov.uk/2011/09/27/carbon-monoxide-poisoning-alert/>

Costs then just of England and Wales are:-

50 deaths at £1,565,000.....	£78,250,000
4,000 near misses at £17,900.....	£71,600,000
Total.....	<b>£149,850,000</b>

The DOH figures above do not include N. Ireland or Scotland. Many CO deaths in Scotland are not recorded properly even by CO-Gas Safety because there is no coronial system there.

\*All CO incidents are reportable under RIDDOR.

**Appendix B Please see line in bold and underlined by CO-Gas Safety.**

**CCU Ref: DWOE283024/GM**

24 September 2012

Stephanie Trotter OBE

[office@co-gassafety.co.uk](mailto:office@co-gassafety.co.uk)

Dear Mrs Trotter,

Thank you for your email of 20 August to the Cabinet Office about a proposed levy on gas suppliers to fund carbon monoxide (CO) safety awareness. It has been passed to Defra and I have been asked to reply.

As you mention, the Health and Safety Executive (HSE) recommended a gas levy, mainly to fund consumer awareness campaigns, in its Fundamental Review of Gas Safety in 2000. Approaches have changed since then and colleagues at HSE confirm that it does not envisage such a levy as viable at present.

**To introduce the levy would have required primary legislation, which HSE opted not to pursue.** HSE did, however, pursue voluntary agreements with the six biggest gas suppliers to fund a national gas safety strategy that would include publicity about the dangers of CO poisoning. Following on from this and the findings of its 2006 Review of Domestic Gas Safety, HSE established



the Gas Safe Register, which is solely focused on consumer gas safety. Capita, which operates the scheme, is required to increase consumer awareness of gas safety risks and is monitored by HSE through a series of Key Performance Indicators (KPIs) to ensure that improvements are made. The KPIs focus on ensuring gas safety awareness among all gas consumers as well as raising awareness among less aware groups, such as the elderly and students. There are contractual and financial implications if the KPI targets are not achieved.

Yours sincerely,

George Mackie  
**Customer Contact Unit**  
Defra

Department for Environment, Food and Rural Affairs (Defra)

### **Appendix C – Recent report posted 16th December 2012 showing that GPs don't diagnose CO.**

**<http://en.paperblog.com/carbon-monoxide-poisoningthe-gp-told-me-it-wasnt-37881/>  
Carbon Monoxide Poisoning;**

#### **Carbon Monoxide Poisoning; The GP Told Me It Wasnt**

*Posted on the 16 December 2012 by [Therealsupermum](#)*

#### **Carbon Monoxide Poisoning;The GP Told Me It Wasnt – A Mum Shares Her Frightening Story**

At 10 weeks my baby girl had become very poorly, constantly being violently sick and always sleeping (nothing unusual for a young baby), if she wasn't sleeping she was screaming, losing weight rather quickly. Back and forth to the doctors and my Health Visitor and I were reassured my baby just had reflux, I was given 2 prescribed medicines that didn't seem to help.

The only thing that would stop her being sick is when she was out the house, she wouldn't be as poorly.

At 13 weeks on the 7th January our baby was in her bouncer in the front room (we had a very small front room and that was the warmest room in the house). I took her out to change her clothes as yet again she'd been sick after I had breast fed her, something caught my eye on the gas fireplace which alarmed me straight away, it was hissing and just looked different.

I thought back and clicked on that I had a sore throat for a while. My little boy was at nursery most of the time or playing in the other room, and my partner works nights so hardly spent time in the front room.

I rushed upstairs and turned all the gas off.

I woke my partner up to check it out, within hours British Gas were out and condemned our boiler. Taking advice from my Health Visitor I took my kids to the GP to get them checked out.

The GP told me it couldn't possibly be Carbon Monoxide Poisoning because their skin color would of been purple!

Not having any of it I took them to A&E for a second opinion, my daughter was put straight on a nebular as her STATS were low. They had a blood test which my daughters come back with unsatisfactory results and my sons were fine. My little girl was kept in for 11 days and sure enough her sickness and screaming stopped within 24 hours of being out the house. I encourage you ALL to go and get yourselves a carbon monoxide detector(one that sets off an alarm, not paper ones) IT SAVES LIVES. CARBON MONOXIDE IS A SILENT LEAK, NO NOISE, COLOUR, SMELL!  
I don't mean to scare anyone with this post, just glad I didn't listen to the GP  
Reproduced by kind permission of [www.therealsupermumblog.com](http://www.therealsupermumblog.com)

### **Response to the briefing note to Don Foster MP by Roland Wessling**

*"I have lost my partner Hazel Woodhams in July 2011 to CO poisoning and almost died myself. I somehow survived but suffered severe injuries, resulting in two weeks in intensive care, a further two weeks in hospital after that, eight operations, six hours in three sessions in a hyperbolic chamber to get the CO out of my system, six months of physio- and hydrotherapy and, to date, over 13,500 painkillers to deal with the aftermath of the injuries. This is the result of taking a small, cold-to-the-touch charcoal BBQ grill into a large tent before going to bed. We were both highly educated people, both had MSc degrees in forensic sciences, Hazel worked as a Scene of Crime Officers for West Yorkshire Police and I teach forensic science at the UK Defence Academy/Cranfield University. We should have known that there was a risk of CO from the charcoal but we didn't. We had a CO detector in our house but that was not enough to save Hazel's life.*

*CO can threaten in many different scenarios and kills almost instantly. Without proper education, greater awareness and safer products, more and more people will die as the result of CO poisoning and some of these cases will not even be attributed to CO. I was arrested when the police arrived on site. What they saw was a couple, one dead, the other injured and some form of 'drug' involved. I was de-arrested six hours later when the hospital confirmed the CO level in my blood. And I do not blame the police officers on the scene in the slightest but the 'Roland Wessling, I arrest you for the murder of Hazel Woodhams' will always be with me. The thought that anyone could contemplate that I killed the person I loved most in the world, is completely overwhelming.*

*CO killed Hazel and almost killed me. In the 12 months following Hazel's death at least 7 others died from CO poisoning in a camping context alone. Several family members were arrested, just like me. I therefore fully support CO-Gas Safety in their efforts to improve the situation outlined in the suggestions to amend the Energy Bill."*

**Response by Ed Walker, Lead on carbon monoxide, clinical toxicology working group, College of Emergency Medicine, also agrees with the proposed amendments.**

**Andrew Humber, Team Supervisor, Hazardous Area Response Team also agrees.**

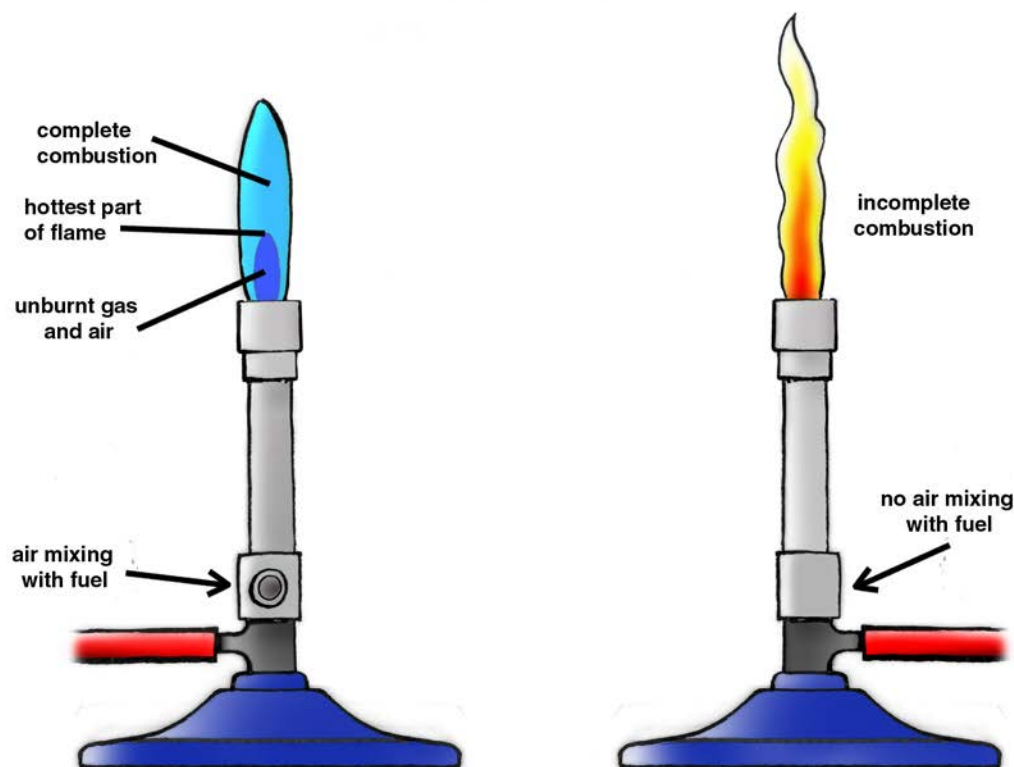
**The Sellars family, also agree.** The family consisting of parents Joanne, Stephen and two young girls, suffered carbon monoxide poisoning from the faulty flue installed in their new build house in Wigan Lancashire from 1988 to 1997. The living room was heated by a gas fire connected to a badly installed and designed flue. For up to 9 years they were subjected to high levels of carbon monoxide poisoning. Stephen was tested and assessed by toxicologist John Henry at the Poisons Unit of Guys Hospital, and was found to be suffering from severe executive dysfunction (as a result of the CO exposure). This was obviously the reason why the family business he had built up and managed successfully for up to 10 years prior to the poisoning had started to fail which resulted in him being made bankrupt for £½ million in 1990.

His wife Joanne suffered brain damage (in her basal ganglia) as a result of the 7 years of CO poisoning they endured in their new build home, which caused a section of her brain (about the size of a 50p) to die, therefore resulting in her developing incurable epilepsy and she has now to be on medication for the rest of her life. See <http://www.biomedsearch.com/nih/Chronic-carbon-monoxide-poisoning-resulting/22689549.html>

## One page example of material put together by Roland Johns & checked by Dave Williams both ex British Gas to teach aspiring registered gas installers about carbon monoxide

For full version see [http://www.co-gassafety.co.uk/trainers\\_of\\_gas\\_installers.html](http://www.co-gassafety.co.uk/trainers_of_gas_installers.html)

We hope that this material will be used by training establishments and perhaps finally those responsible for designing training material can add to this as necessary and agree a version to be used by all training establishments in order to prevent deaths, such as that of Matthew Nixon, registered gas installer aged 22, who died in December 2010 from CO from the use of a petrol generator in a room to power his tools.



# SCOTIA GAS NETWORKS

In 2006 Scotia Gas Networks reviewed its working practices for its operatives carrying out downstream emergency work. This is work that takes place on gas pipes and fittings, up to the meter. Scotia Gas Networks were concerned that emergency work on gas escapes inevitably exposes workers to gaseous atmospheres, including carbon monoxide. The review found that the use of gas instruments to test the atmosphere was only done periodically during work activities and that atmospheres can change quickly, often becoming hazardous without warning.

Safe working procedures to exit unsafe situations or wear breathing apparatus rely on knowledge that the atmosphere is unsafe. Scotia Gas Networks concluded that its maintenance operatives should be provided with personal atmosphere monitors with alarms set at pre-determined levels. As First Call Operatives are exposed to the risk from the leakage of carbon monoxide (especially as they attend reported emergencies of carbon monoxide leakage and work on gas apparatus in confined spaces), Scotia Gas Networks decided that they should also be issued with personal atmosphere monitors.<sup>1</sup>

## *Carbon monoxide safety in the home*

These personal atmosphere monitors have activated whilst First Call Operatives were attending gas escapes and reports of carbon monoxide fumes on a number of occasions. When a carbon monoxide alarm activates in customers' premises the First Call Operative is required to investigate the cause and report it to Scotia Gas Networks' incident reporting team.

Between January 2009 and February 2011, there were 118 reports of personal atmosphere monitors activating in customer's premises due to the presence of carbon monoxide whilst First Call Operatives were undertaking both emergency work and non-emergency work.<sup>2</sup>

Reproduced by kind permission by the All Party Parliamentary Gas Safety Group (now the All Party Parliamentary Carbon Monoxide Group) and of Scotia Gas Networks.

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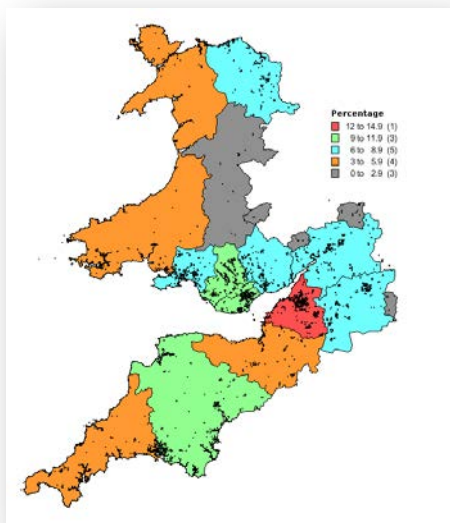
<sup>1</sup> The personal atmosphere monitors used by Scotia Gas Networks are set at 30ppm (Time Weighted Average for long term 8 hour exposure limit) and 200ppm (Short Term Exposure Limit – 15 minutes).

<sup>2</sup> If a CO alarm activates in a premises the first call operative is required to investigate the cause in accordance with Scotia's procedure for attending reported carbon monoxide fumes to safeguard life and assess "Immediately Dangerous" and "At Risk" situations, or if applicable to apply a "Concern for Safety" notice. All CO alarm activations must also be reported to the Scotia's incident reporting team. Other than the immediate on site actions, consistent with attending a reported CO emergency, Scotia do not undertake post incident investigations.



# WALES & WEST UTILITIES

## Wales & West Utilities – Working to raise awareness of Carbon Monoxide



Incident locality data (excluding battery failures)

In 2012, Wales & West Utilities' first call operatives attended nearly 7,000 emergency visits relating to suspected Carbon Monoxide incidents, or where the engineer visiting the property suspected the occupants were at risk from Carbon Monoxide. This represents around 7% of our emergency calls last year. On inspection, just under half of these were found to be battery failures of audible Carbon Monoxide alarms, however, this still leaves a high level of likely incidents.

Each month these incidents are mapped geographically onto our network providing the ability to tailor and target our initiatives to the area's most at risk.

At every incident, WWU's engineers provide advice and support and where there is evidence of spillage, appliances are made safe with 'concern for safety' notices left with the occupiers. Additionally, recognising our shared social obligation to raise awareness of this poisonous gas, WWU has taken a proactive approach to raising awareness of this important issue, both with our direct labour and contract staff and, more widely, to the 7.5 million people who live and work within our network. We are constantly looking for new and innovative ways to spread the message across our network and our planned awareness programme – which ultimately aims to help reduce the number of deaths and injuries from CO poisoning – is estimated, over the coming twelve months to reach over one million people.

In addition to our support for CO-Gas Safety's Posters for Schools competition, WWU are undertaking a number of initiatives tailored specifically to children. Utilising our incident data to map CO hotspots, we have been able to target trials of these initiatives in the most at risk areas.



Poster competition at the National Eisteddfod of Wales

Amongst the other new and innovative initiatives being undertaken, some of the initiatives specifically tailored to young people include;



Carbon Monoxide – “what you should know” at the Royal Welsh Show

### *Bespoke safety exhibition*

A series of events featuring a bespoke exhibition highlighting the dangers of CO. Working with the science and technology centre, Techniquest, we have developed an interactive touch screen exhibit in which children and adults alike are asked to spot the Carbon Monoxide dangers in the home environment. The key objective of our exhibit is to ensure the message is both interesting and educational.

In 2012 we took our 150 sq metre exhibition to the Bath & West Show, Royal Welsh Show and National Eisteddfod of Wales. WWU is already making plans to continue its presence at all of these shows again next year as well as adding another carbon monoxide hotspot – Cornwall – to the list by attending the Royal Cornwall Show. The shows have an anticipated footfall of well over half a million people and in 2012 we interacted directly with over 4,000 families providing each with a CO alarm.

Once visitors had played the interactive game, they were asked to answer some key questions about what they had learned in order to win the alarm. This was very popular with families and was highly praised by show organisers as the company was named the winner of two major Show Awards – the Best Exhibitors Stand and the Gold Medal for the Stand of Educational Value.



**Clive the dog helps spot the CO dangers**

We are currently working on making this exhibit more portable for use in schools and other educational establishments.



### *Radio campaigns*

Our “Create a Campaign” competition in partnership with Swansea Sound and the Wave asked children to write a radio commercial on the dangers of carbon monoxide and gas safety. The competition was promoted for 6 weeks alongside key CO facts. The best three entries were invited in to the studios to record their commercial which was then played for a week on Swansea Sound and The Wave. Over the seven weeks on air, 238 trails were broadcast. These reached 247,040 listeners. A teacher from Penyrheol Comprehensive, one of the winning schools, said; “The pupils really enjoyed taking part and all said they were going home to ask their parent’s to get alarms! They seemed to learn quite a lot about carbon monoxide. We listened to it in school and we all heard it on air! I think it was a really worthwhile thing for them to do.” The winning commercials will be used as our company hold music to raise awareness amongst inbound callers to WWU.

**Some of the winners creating their commercial**

### *Fresher’s fairs*

We have also taken the message to students at Fresher’s Fairs in Cardiff. Students are a potentially vulnerable group for CO poisoning because a large number live in privately rented accommodation and so WWU was quick to take the opportunity of spreading the vital awareness message.



This is just an overview of some of the CO related projects we are currently undertaking. For further information on these initiatives, information on our activities to promote awareness amongst other groups, or to discuss future partnership opportunities, please contact;

[Danielle.royce@wwutilities.co.uk](mailto:Danielle.royce@wwutilities.co.uk)

## **Winners of the 2011-12 Competition**

### **North of England**

Rhys Michael Carley-Jones. Age at entry 11  
School: Abbey Gates Primary School, Nottingham  
Teacher: Paul Summers  
MP for the School, Mark Spencer, MP

### **South of England**

Sabah Hafeez. Age at entry 11.  
School: Courthouse Junior, Maidenhead  
Teacher: Tricia Stephenson  
MP for the School, Theresa May, MP, Home Secretary

### **Winner for Scotland**

Erin McLaren. Age at entry 11  
School Coupar Angus, Perthshire  
Teacher: Pamela Canning  
MP for the School Pete Wishart, MP MSP for the School John Swinney, MSP

### **Runner up**

Alex Dowman. Age at entry 11.  
School: Sheffield High School, Junior  
Teacher: Sarah Groombridge  
MP for the school, Paul Blomfield MP

## **A Big Thank You to the Sponsors of our Competition and those who have helped us through the year**

**Scotia Gas Networks**, which is very kindly sponsoring the competition for Scotland and the South and also paying for our event at the House of Lords. SGN also kindly paid for our advertorial about the competition in First News.

**Wales & West Utilities** which is kindly sponsoring the competition in Wales and paying for the press packs

**Northern Gas Networks** which is kindly sponsoring the North of England for the first time.

**Honeywell** which has kindly supplied us with alarms to EN 50291 this year.  
Also thank you to those who have generously given to us throughout our 18 years and in particular:- **Kane International** – which has kept us going generally.





# CO-Gas Safety Poster Competition

Registered Charity Number: 1048370

[www.co-gassafety.co.uk](http://www.co-gassafety.co.uk)

**Calling all Primary School Teachers and Pupils aged 10-11!  
We want YOU!**

Please help raise awareness of the dangers of carbon monoxide (CO) poisoning!  
CO-Gas Safety is an independent registered charity and is running a Schools Poster Competition for a sixth year to highlight the dangers of CO and other dangers from using fuel that burns.

**Entry is FREE**

**PRIZES are at least £300 for each winning pupil and at least  
£500 for each winning school!**

**Competition for this year closes 31<sup>st</sup> July 2013**

All teaching materials are on the website, including a downloadable  
Power Point Presentation See <http://www.co-gassafety.co.uk/competition.html>

There are four regions, North England, South England, Scotland (both kindly sponsored by Scotia Gas Networks) & Wales (kindly sponsored by Wales & West Utilities). There will be 4 winners.  
Presentation at the House of Lords, January 2014.



Teachers - You could ask your pupils to spot the CO dangers in this picture.

Answers see <http://www.co-gassafety.co.uk/answers.html>

**The charity is hoping for some brilliant entries to get the message across simply**

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## CO GAS SAFETY - POSTER COMPETITION 2012/13

# RULES

1. The competition asks students to produce an informative, accurate and eye-catching poster warning of the dangers of Carbon Monoxide (CO) poisoning and/or fumes and/or how to avoid them. Material about CO and how to avoid it and other fuel toxins can be found at [www.co-gassafety.co.uk/competition.html](http://www.co-gassafety.co.uk/competition.html)
2. There will be one year group Year 6 in Primary School (ages 10-11) in the autumn term 2012 (or any other student who joins this year in 2012-July 31<sup>st</sup> 2013 but who is the correct age as specified above).
3. Students can use any medium (paints, crayons, painting, photographs etc.) provided it is the individual student's own individual and original work. Students must not work together.
4. Students may consult books or the Internet for information or ideas, but no credit will be given for material simply printed off the computer or photocopied etc.
5. Entries must be photographed and emailed (1 entry per person per email) in JPEG format to: [postercompetition@co-gassafety.co.uk](mailto:postercompetition@co-gassafety.co.uk)
6. Entries should reach CO-Gas Safety by no later than midnight on July 31<sup>st</sup> 2013. To avoid any confusion **please make sure that each entry/poster is clearly labeled on the poster itself with the name and age of the student and the name and address of the school** and please repeat this information in the accompanying email.
7. The winners will be awarded prizes and the best ones may be put on display in the media or used to further raise awareness.
8. The judges' decision on all matters will be final and no correspondence will be entered into with regard to any matter concerning this competition. The charity will try to clear up any ambiguities that may be brought to its attention (email [office@co-gassafety.co.uk](mailto:office@co-gassafety.co.uk)) and rules may be amended accordingly from time to time in order to clear up any such ambiguities brought to our attention.
9. Provided there are enough entrants, there will be four regional winners, North England and South England, Scotland and Wales. Prizes will be £300 for each winning student and at least £500 for each winning school\* (although if we obtain more sponsorship, we may increase this).
10. For those being home educated, parents can nominate either a school or a Local Education Authority etc. to receive the £500 winning prize for the 'school'.  
Please note that groups of the relevant ages such as scouts etc. can also enter provided they nominate a recognized organization, such as scouts, guides etc. as the 'school' to receive the prize.
11. By entering all entrants, (if winners), agree to attend a prize presentation at a venue to be notified to the winners, probably at the Houses of Parliament usually during the last week or so of January in the year following (e.g. if poster sent by 31.07.2013 wins, prize giving end of January 2014). For this year 2012-2013 Scotia Gas Networks are sponsoring the entry for Scotland and for the South of England. Wales & West Utilities are sponsoring Wales. Northern Gas Networks are sponsoring the North of England.  
Reasonable expenses for travel, food and accommodation costs for attending the prize giving venue of students and a parent/guardian will be reimbursed provided original receipts are received and sent to an address that will be sent at request after the invitation to the event is sent. We suggest that receipts are copied in case of loss in the post. Expenses will be reimbursed by a cheque. In exceptional circumstances the charity will consider providing some money to pay for travel before the event but only in cases of dire need. At the event one overall winner for the UK may be announced selected from the regional winners.
12. Upon entry, all entrants agree that all copyright and other intellectual rights to the posters will become the property of the registered charity, CO-Gas Safety.

For further information please visit [www.co-gassafety.co.uk](http://www.co-gassafety.co.uk) or email [office@cogassafety.co.uk](mailto:office@cogassafety.co.uk)

**'If you have any queries or worries please email Stephanie Trotter OBE [office@co-gassafety.co.uk](mailto:office@co-gassafety.co.uk)'**

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## SCHOOLS POSTER COMPETITION INFORMATION ABOUT CARBON MONOXIDE

### SECTION ONE

#### TO BE READ BY PUPILS/STUDENTS WITH THEIR PARENTS AND TEACHERS BEFORE DESIGNING A POSTER

#### **The Silent and Invisible Killer**

The Department of Health announced in 2012 that every year about 50 people in the England & Wales are recorded as having died of carbon monoxide poisoning. About 4,000 visit their A & E with CO symptoms. Many suffer ill-effects as a result of exposure to carbon monoxide: sometimes they are permanently disabled. Carbon monoxide can be emitted from faulty domestic heating and cooking appliances.

CO-Gas Safety believes that even these figures are the tip of an iceberg for many reasons:-

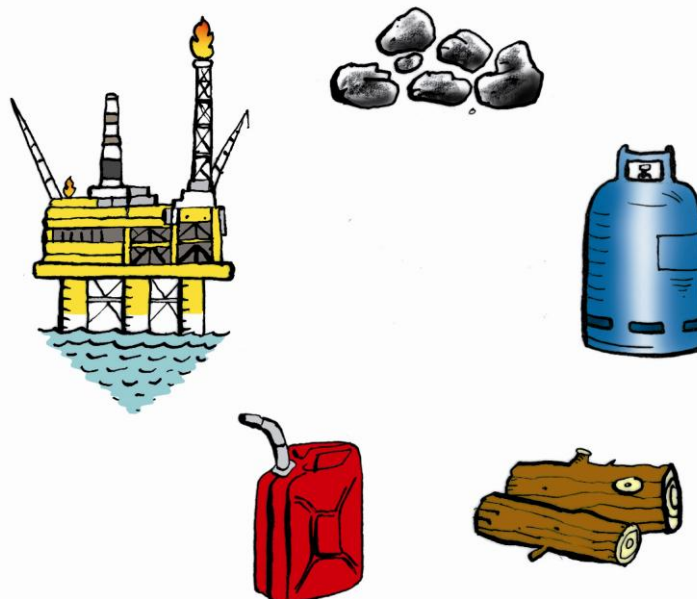
1. GPs rarely test for carbon monoxide.
2. Dead bodies are not automatically tested for carbon monoxide.
3. Heating and cooking appliances are often not tested for carbon monoxide.

Greater awareness of the dangers of carbon monoxide and other products of combustion and toxins in fuel as well as the need for ventilation, proper servicing and chimney sweeping could prevent these tragedies.

#### **What is carbon monoxide?**

Carbon Monoxide (CO) is a toxic gas, which can be emitted from the burning of any fuel.

#### **Can you name any fuel that burns?**





Gas (mains or bottled), solid fuel (coal, wood, etc) petrol, oil, paraffin.

**Can you find any possible sources of carbon monoxide in this picture?**



### **Why is Carbon Monoxide called CO?**

The fuels that we use on a daily basis all contain carbon. Sources of carbon include charcoal, oil, natural gas and petrol. When we burn these fuels the carbon combines with oxygen in the air. If there is enough air, carbon dioxide is produced. Carbon dioxide or CO<sub>2</sub> is formed from one atom of carbon and two atoms of oxygen.



Carbon monoxide, CO is formed from one atom of carbon and one atom of oxygen.



So you can see that the less oxygen there is at the flame the more likely it is that carbon monoxide will be formed. This is why it is so important to burn fuels in a well ventilated area.

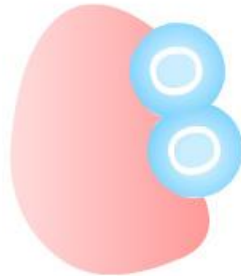
### **The dangers of carbon monoxide**

Carbon monoxide is a highly toxic gas. Less than 2% of CO in the air can kill in two minutes (see [http://www.hse.gov.uk/foi/internalops/hid\\_circs/technical\\_osd/spc\\_tech\\_osd\\_30/spctecosc30.pdf](http://www.hse.gov.uk/foi/internalops/hid_circs/technical_osd/spc_tech_osd_30/spctecosc30.pdf) at Para 74 Table 23)

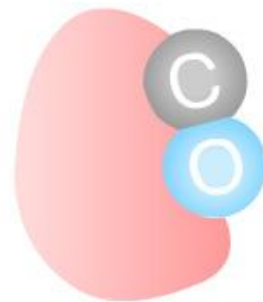
Low level exposure of CO over a long period can cause brain and neurological damage.

## Why is carbon monoxide so toxic?

The red blood cells in your bloodstream carry oxygen to all parts of the body. Each red blood cell contains molecules of haemoglobin. Oxygen binds to the haemoglobin and when it gets to where it is needed in the rest of the body, the oxygen breaks away.



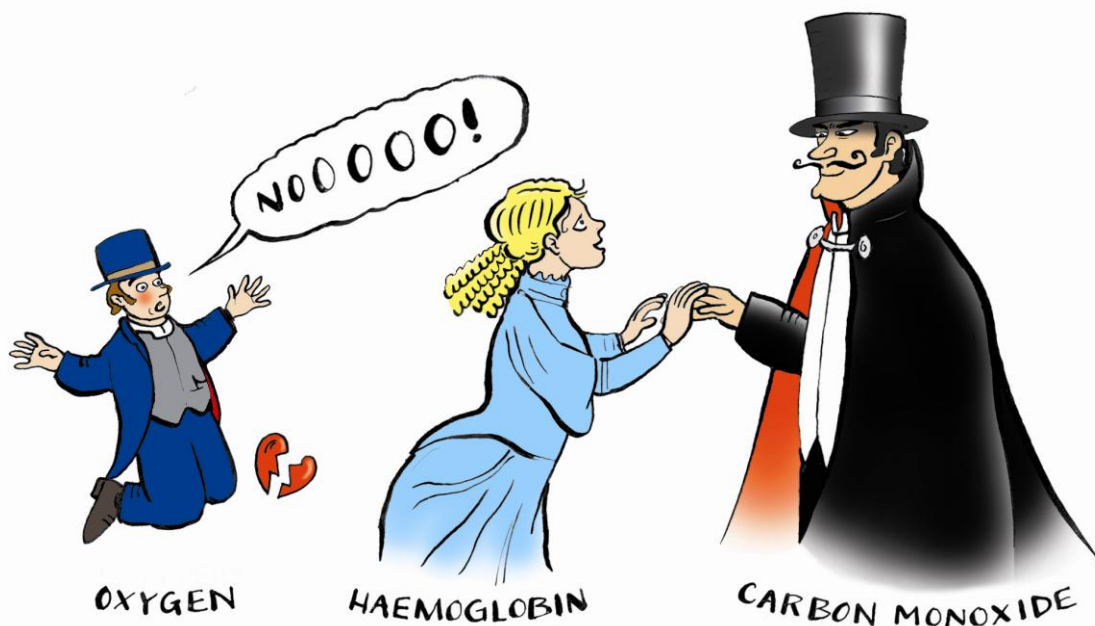
Carbon monoxide can also bind to the haemoglobin but it doesn't break away again.



Effectively carbon monoxide blocks the haemoglobin, making it useless for carrying oxygen.

This explains why CO can poison in tiny amounts.

Haemoglobin is attracted to the deadly charms of carbon monoxide



**CO cannot be sensed using human senses, (hearing, seeing, tasting or feeling).**



**Do you know that miners used to take canaries down the mine?**

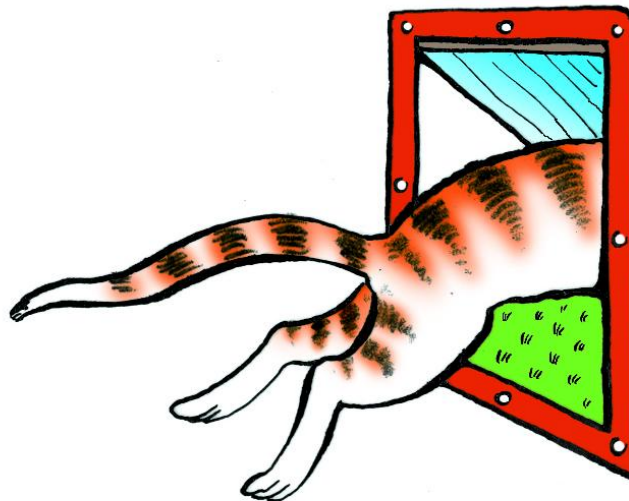
Do you know why?

Because the poor canary (being very small) would die first and this would alert the miners to the presence of CO or other toxic fumes.

These days, special equipment, such as a flue gas analyzer, is needed to test appliances and/or the air in a room for CO.

Animals can still warn of dangers in the home. You may find your cat won't stay in the house.

Dogs may also behave strangely or have a sore throat or mouth.



Please note that although you can't smell CO itself, you just might be able to smell some of the other products of combustion, which may have escaped into the room rather than gone up a chimney, (because it is partly blocked for example). Sometimes people describe this smell as 'gassy' and think there has been an escape from a gas pipe supplying natural gas to the house or appliance.

**Research shows how widespread the problem is**

Research undertaken by University College London has found:-

1. 23% of homes had one or more defective gas appliance;
2. 8% of homes were judged to be at risk of dangerous levels of CO; (*equates to about 4.5 million people in the UK*)
3. 45% of homes had received no information on the dangers of CO; and
4. A higher prevalence of problem appliances was found in the homes of vulnerable people (young, old, those in receipt of benefits).

The above is taken from an HSE Press Release 02.10.06

This has been confirmed in a wider research programme from Liverpool John Moore's university see [http://ljmu.ac.uk/NewsUpdate/index\\_123350.htm](http://ljmu.ac.uk/NewsUpdate/index_123350.htm) More than 27,000 properties were visited.

### Symptoms of CO poisoning include:

- Headaches
- Nausea, (feeling sick)
- Exhaustion, (feeling unnaturally tired)
- Drowsiness, (wanting to go to sleep more than usual)
- Dizziness, (feeling funny as if you are going to fall over when standing up and perhaps feeling funny sitting down)
- Vomiting, (being sick)
- 'Flu like' symptoms, (generally feeling unwell. Some people suffer tummy aches and quite often different people suffer from different symptoms)
- Palpitations, (feeling your heart beat oddly)
- Chest pain, (pain in your chest)
- Collapse without necessarily losing consciousness, followed by unconsciousness and perhaps death.

The elderly and young are at higher risk than healthy adults. If you are suffering any of the symptoms, especially if more than one person in the house is suffering, you may be at risk of CO poisoning. Another thing to think about is, are you better when away from the house?

Look  
for the



Please bear in mind that family members can suffer different symptoms, for example, the mother may be tired and have a headache, the son may be dizzy and act strangely and always want to be out of the house, the daughter may have a bad stomach ache, while the father may just be bad tempered. The problem is that such symptoms could be nothing or they could be CO.



## Diagnosing CO poisoning

Doctors are generally poor at diagnosing CO. Doctor John Henry, former Consultant Physician at the National Poisons Unit, surveyed 200 general practitioners. He sent them symptoms of CO poisoning and requested their diagnoses. Although many sensible suggestions were made, not one GP suggested CO as a cause of these symptoms.

Some doctors' surgeries have equipment, (sometimes called a Smokelysler or ToxCo), to analyse breath for CO. This is easy, painless and provides an instant result. If this shows CO, a simple blood test may be required to confirm the diagnosis. However, a blood or breath test can produce a falsely negative result if too much time has passed between exposure to CO and tests being carried out. Do not assume that your appliances are safe just because the test results were negative.

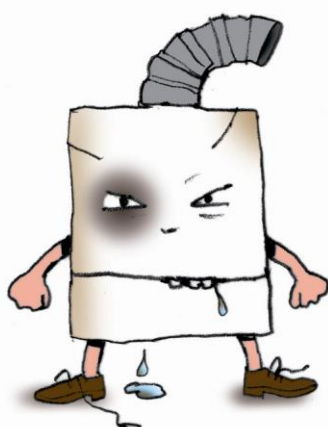
### What do I do if I suspect I have been exposed to CO?

1. Get out of the house or place where the poisoning is occurring (e.g. workplace, garage, etc.) or if you can't do this
2. Open all windows and doors and turn off all appliances.
3. Call the Gas Emergency number on 0800 111999 (e.g. from a neighbour's house)
4. Get to your GP or to the Accident and Emergency department at a hospital as soon as possible and ask for an immediate blood or breath test for CO. Find someone to go with you if possible. A visit to a doctor may also be helpful to prove CO poisoning or at least to record symptoms suffered by you that are consistent with CO poisoning. If exposure to CO is severe, treatment with hyperbaric (high pressure) oxygen is often recommended.

### Can CO pass between houses?

Yes, through a joint chimney for example. Alternatively CO or other products of combustion can leak from the flat above or the flat below.

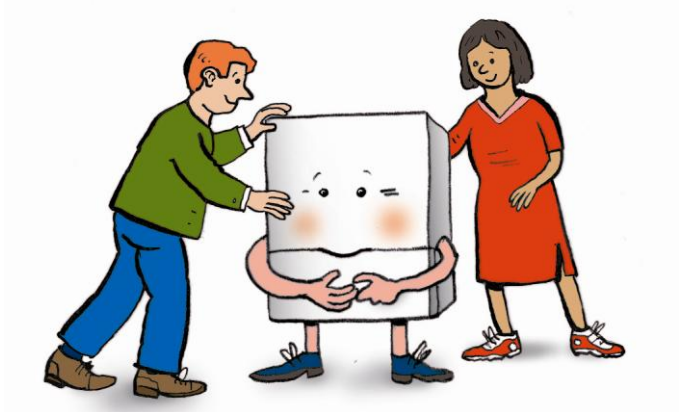
Please note that the National Gas Emergency Service, (responsible for gas emergencies) has no equipment to trace CO. We think this is like sending someone out to trace radioactivity without a Geiger counter! However, most now at least have some Personal Alarm Monitor to protect the person who calls, the First Call Operative but you will have been told to turn off appliances and open windows so by the time the FCO calls, there probably won't be any CO present even if there was before you turned everything off.



*How safe is your boiler?*

## Take these simple steps to CO safety - it's just commonsense

1. Look at all your appliances. Do they look unsafe?  
They should look clean (i.e. no soot or dirt around it and no water leaking from it) and burn with a blue flame.



2. Have all appliances installed and serviced at least once a year by a properly qualified person. For gas appliances this means that only someone who is on the Gas Safe Register should inspect or service them.  
Don't be shy about asking for proof of their training and experience - it's your money and your life. You can check that the individual who comes to your house is qualified to work on that particular appliance on the Gas Safe Register website <https://engineers.gassaferegister.co.uk/> or ring 0800 408 5577.  
Ensure that your gas fitter uses a flue gas analyser or similar equipment to check for CO gas to find which appliance was emitting the CO and how many parts per million.



3. Make sure chimneys and flues are swept regularly, at least once a year, by a fully qualified sweep.

Make sure the chimney does not end in the loft or leak into the loft (e.g. sometimes unscrupulous builders won't bother to ensure that the chimney goes up through the roof).

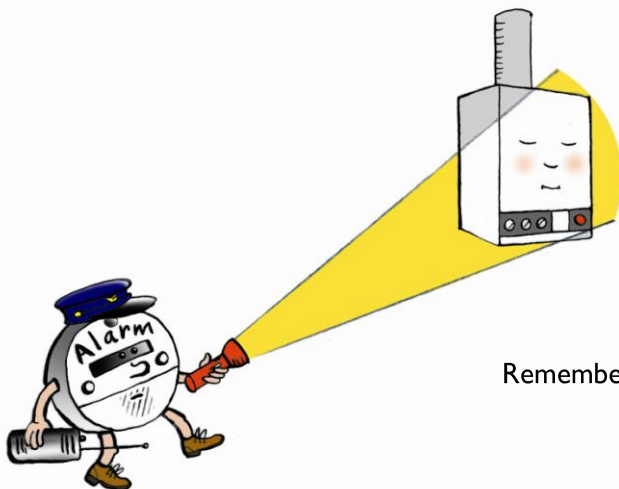
It is important that chimneys and flues are kept clear so that all the products of combustion go harmlessly up the chimney and not back into the house.



4. Do not block vents or air grilles. Make sure you have some ventilation (open a window). If there is enough oxygen reaching the flame carbon dioxide will be formed, NOT carbon monoxide.

5. As an extra safeguard buy a CO alarm to European Standards EN50291.

This will cost around £15-£20. Alarms are available at most DIY shops and some supermarkets. CO-Gas Safety has never heard of anyone dying with an in date CO alarm who took notice of the alarm in nearly 18 years but we have heard of people still feeling ill with a good alarm, perhaps from low levels of CO or perhaps from other products of combustion or toxins in fuels.



Remember a smoke alarm is NOT a CO alarm.  
A CO alarm is NOT a smoke alarm.

Illustrations by John O'Leary [www.oleary-irsara.com](http://www.oleary-irsara.com)

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**Thanks** To all the families of victims and to the brave survivors of poisoning. Without your help we could not carry on. To the teachers, who work very hard instructing their pupils about CO and inspiring them. To those who faithfully attend our events. Your presence is much appreciated. To Baroness Finlay, Barry Sheerman MP, Jason McCartney and David Kidney who have worked hard for APPCOG. Also John Arnold and Visaly Muthusamy. Thanks also to Carolyn Craggs, the statistician who has validated our data. She has been incredibly conscientious and yet easy to work with.

I'd also like to thank Amy Archer of Creative Leopard for her wonderfully helpful work on converting the data into pie charts, etc. She has also found Beverley Squire to take over our data processing. Beverley was a staff nurse and health visitor and we are extremely lucky to have her.

Thanks to all the Coroners and Coroner's officers who have given us so much information over the years. The data also helps us to see trends such as the barbecue deaths. As a result of the tragic death of Matthew Nixon, from CO from a petrol generator in December 2010, we have been helped by Roland Johns (retired from BG) to put material together to teach aspiring registered gas installers about CO. We are also grateful to Dave Williams (also retired from BG) who checked this work and John O'Leary, who drew lots of pictures to help illustrate this new venture as well as our power point presentation etc. for the poster competition. Thanks to Kadee and Alan at Prontaprint, Surbiton & Rich Banks of Tip Top Computers for their kindness and endless patience.

I would like to thank all the directors and MPs, especially Colin Breed MP and Crispin Blunt who have helped the charity over the years. I would also like to thank Baroness Maddock, who has been our patron and stood by us for almost 18 years. She has now retired and we welcome Lord Hunt of Kings Heath and are grateful to him for taking us on. We would particularly like to thank courageous gas installers such as Barry Matthews. We would like to thank Heather Tomlinson, who bravely, while grieving for her beloved son Edward, undertook the huge work of the pilot project schools poster competition. Thanks also to Roland Wessling for speaking at our event this year.

This year we particularly want to thank Scotia Gas Networks, Wales & West Utilities and Northern Gas Networks are equipping or trialling Personal Alarm Monitors and the like. They are also very kindly funding our competition. Flue gas analysers to test the emissions from gas appliances would be even more appreciated. We would also like to thank Ofgem, Stephen Brown and James Veaney, who while being staunchly correct civil servants, have been really helpful to us.

We would also like to thank our directors, particularly Don Neal and Jonathan Kane, who have been directors since we started in 1995. Also Frank Brehany of HolidayTravelWatch.

Thank you to Kane International which has done a great deal to sponsor us over the years. Jonathan Kane is our only industry representative but his advice, from a business perspective, has been incredibly helpful. The support from Kane has also been invaluable.

I would also like to thank Paul Overton, who joined us as a director in 2005, without whom the charity could not have continued.

CO-Gas Safety has always been proud to be a victim based charity. We like to think that at least we've changed the way industry and Government treat victims and their organisations. Thankfully, it seems very strange now, that in 2000 we had great difficulty in even being treated as a stakeholder by the Health & Safety Executive!

**We are actively seeking trustees, ideally victims or their representatives so if you think you would like to help, please get in touch by ringing 01372 466135 or emailing [office@co-gassafety.co.uk](mailto:office@co-gassafety.co.uk)**

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



# Don't get Trapped!

Less than 2% of CO in the air can kill

Carbon Monoxide is a toxic gas which could be emitted from a faulty heating or cooking appliance in your home! So be aware of it, check your home appliances Now!



TOXIC

50 die every year

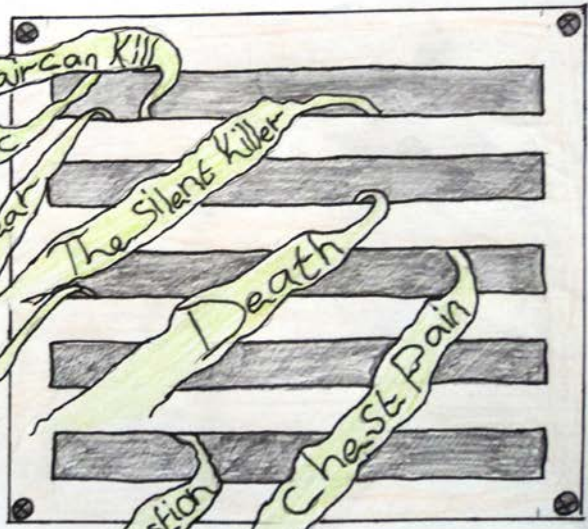
Dizziness

The silent killer

Death

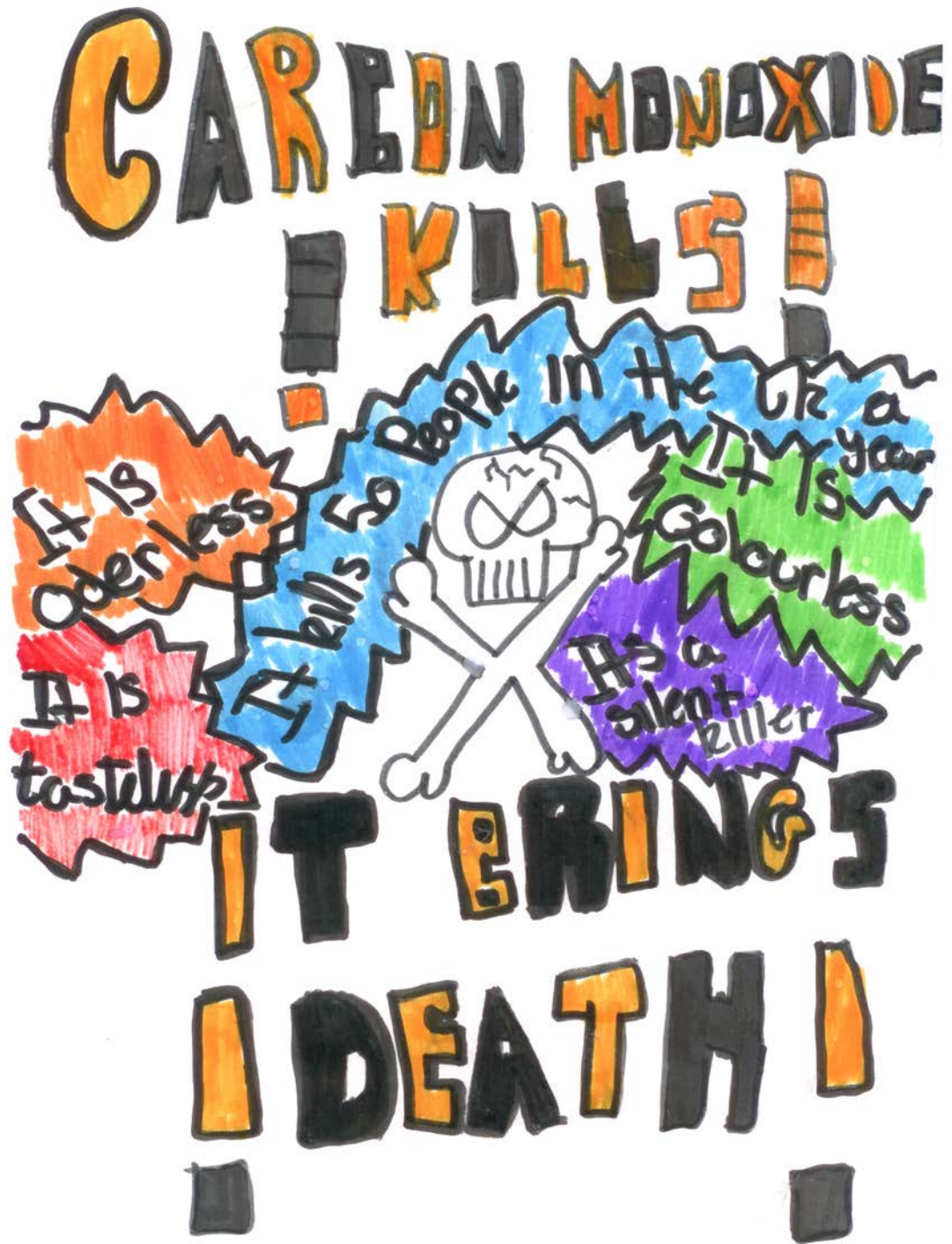
Exhaustion

Chest Pain



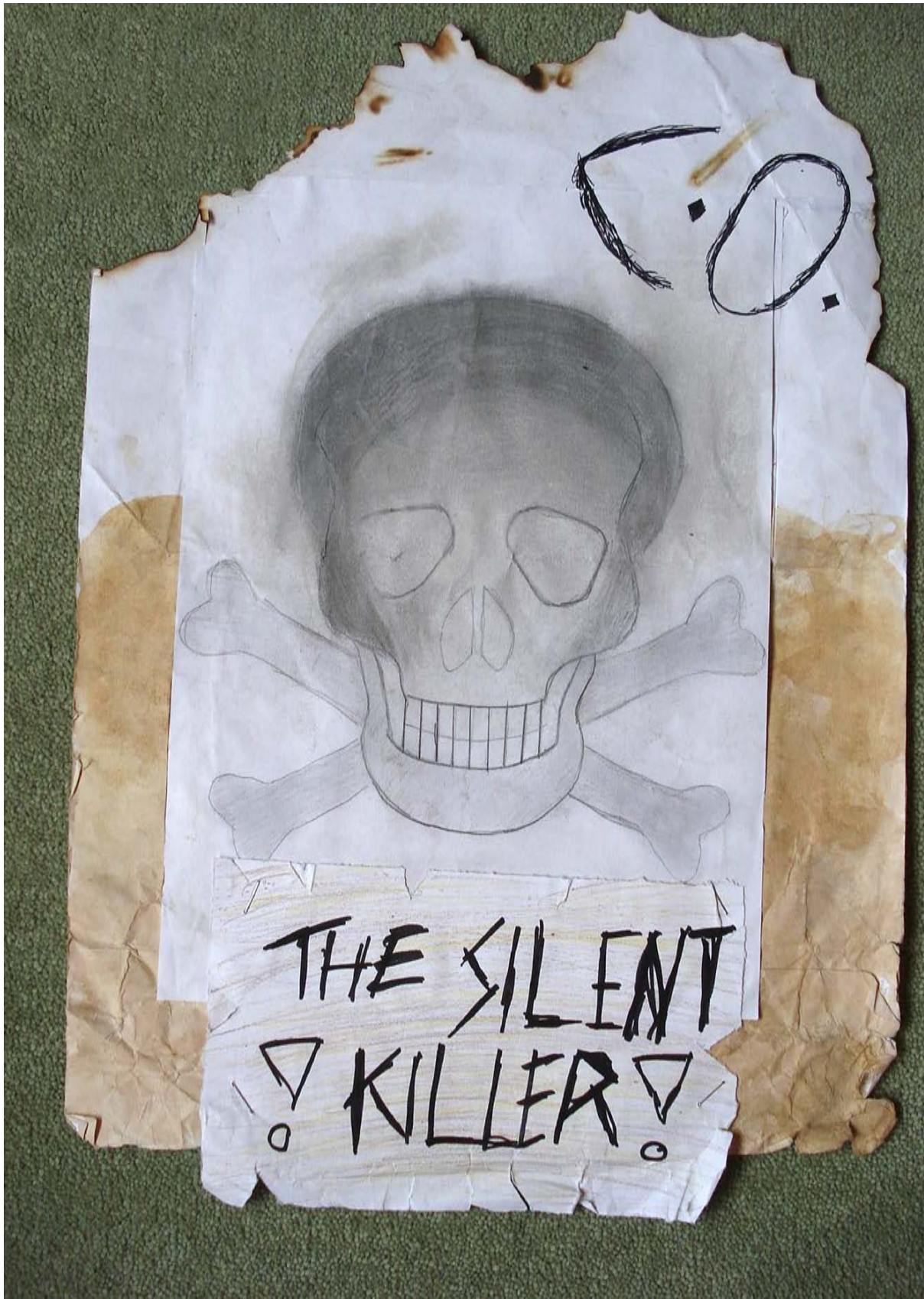
Alex Dowman SHS

**Runner Up. Alex Dowman. Age at entry 11.  
School Sheffield High School  
Teacher: Sarah Groombridge**



**Winner for Scotland. Erin McClaren. Age at entry 11.  
School: Coupar Angus Primary School  
Teacher: Pamela Canning**





Winner for the South. Sabah Hafeez. Age at Entry 11.  
School: Courthouse Junior, Maidenhead  
Teacher: Tricia Stevenson