

Carbon monoxide – the past, the present and the future

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How carbon monoxide poisoning 'works'

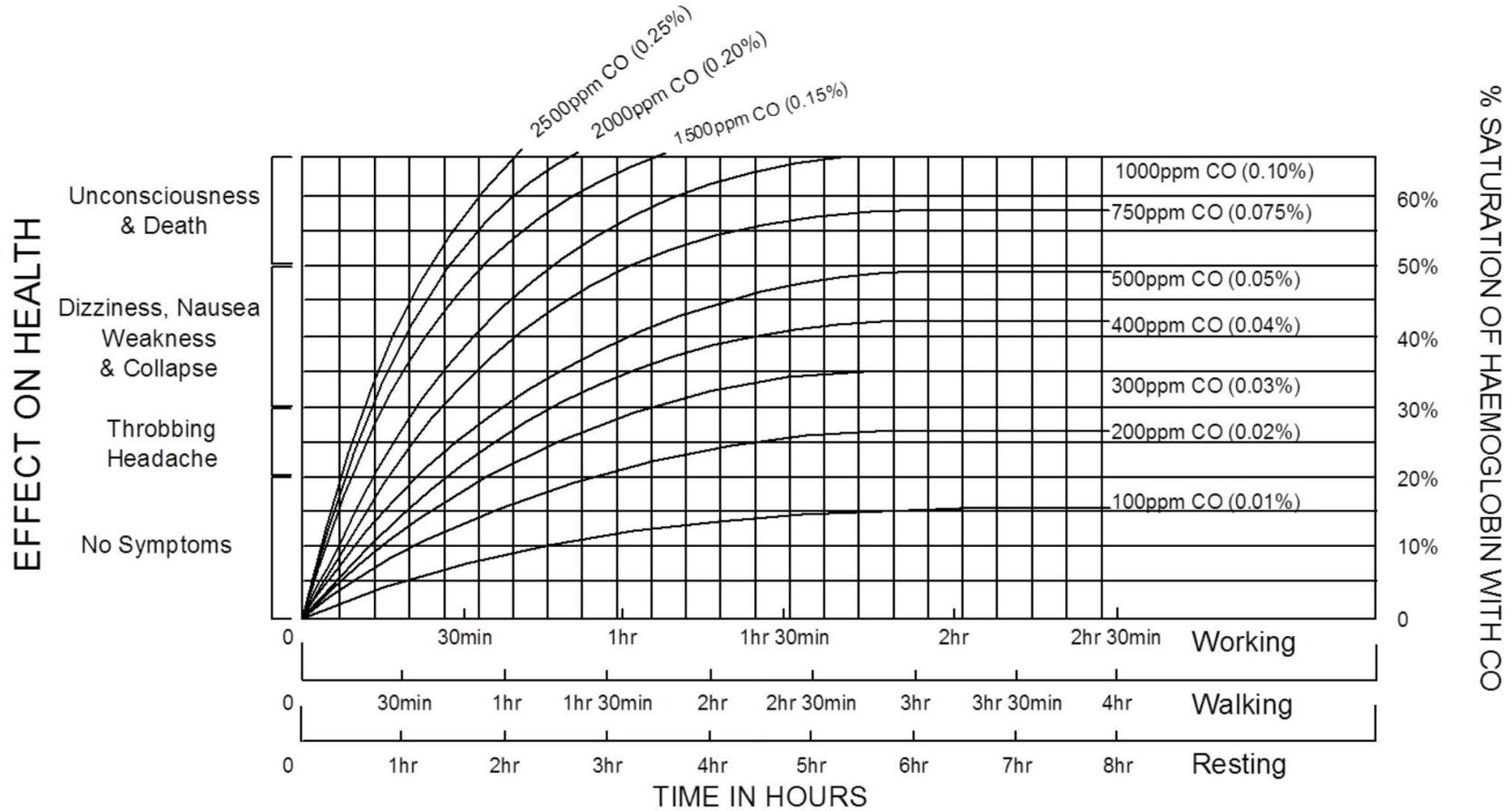
Chronic exposure

- This can result in headaches, fatigue, nausea, dizziness and confusion

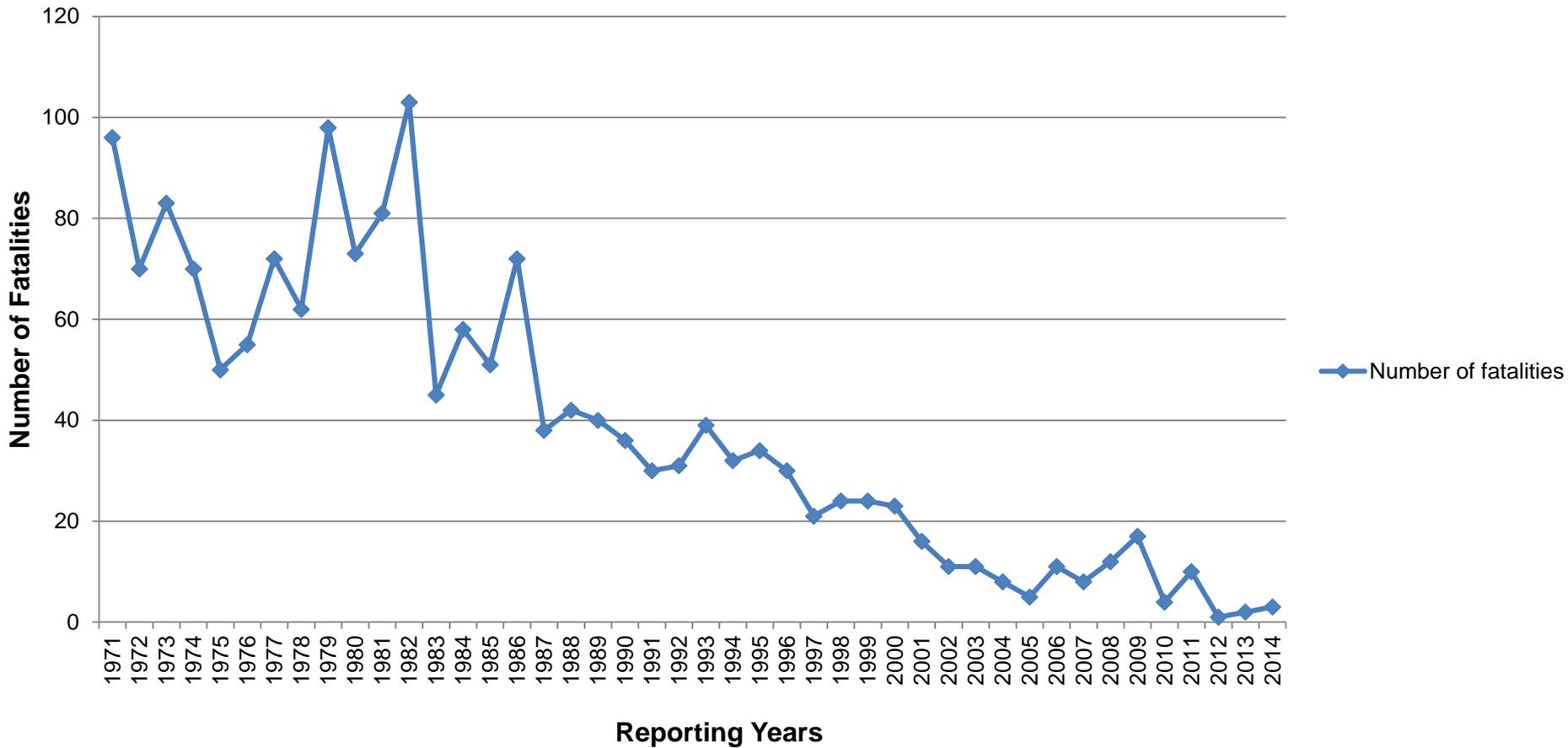
Acute exposure

- At higher levels it can cause shortness of breath, cardiac palpitations, convulsion, paralysis, loss of consciousness, coma and even death

COHb - Effects on Health



Natural Gas Carbon Monoxide Incident Fatalities



Background

- CO Incidents have now been reported for over 40 years
- The Department of Health estimates that there are 40 deaths per year due to CO
- Major organisations have worked together to reduce CO incidents
- HSE set a target of reducing gas related CO fatalities by 20% by 2010
- CO alarms have played a significant role in this
- Increasingly coordinated approach across Government, industry and charity groups to raise awareness on CO issues
- Increased focus on reducing the risks from older appliances

Issues that Cause CO Incidents

A high level risk analysis in 2004 identified the main causes of CO Incidents in the UK :

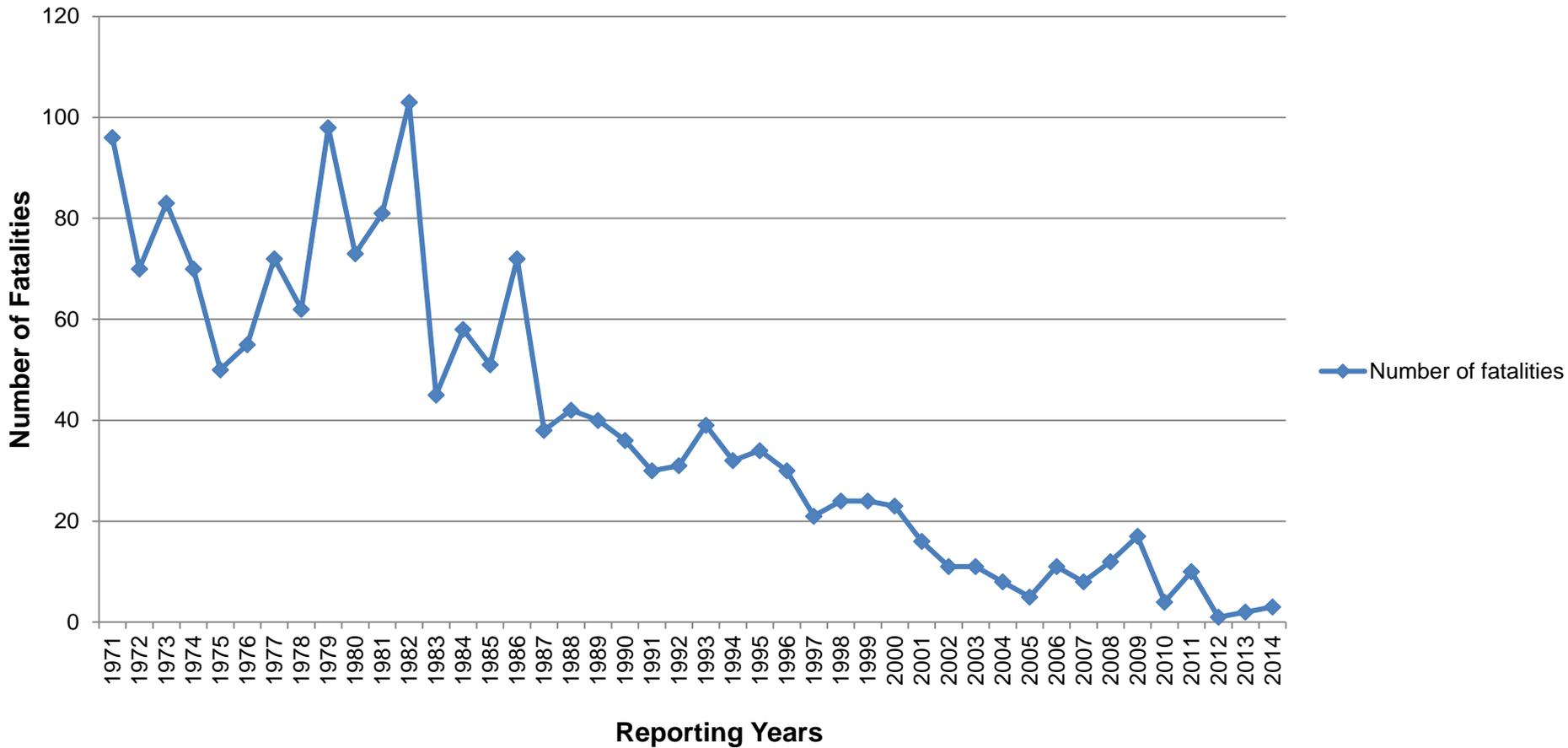
- Open flued appliances - 76% of all incidents
- Open flued central heating boilers - 57% of all fatalities
- Lack of servicing and poor installation
- Defective flues / atmospheric conditions / ventilation deficiencies
- Low customer awareness of CO
- CO coming from neighbouring properties

There is also an increased risk to the young and very old

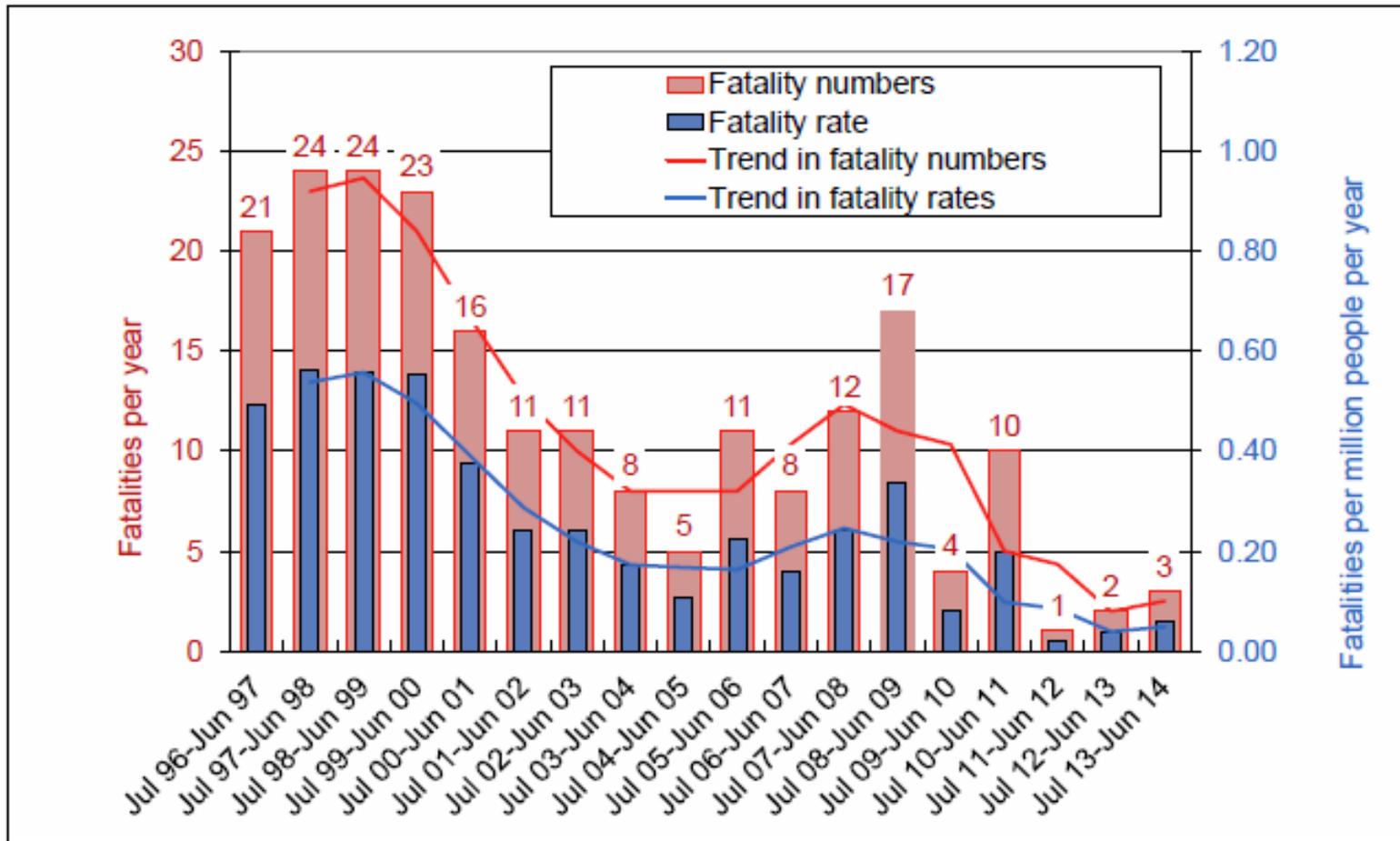
- Penalising unregistered gas installers / encouraging registration
- Replacement of open flued appliances
- Increased regular servicing of appliances
- Coordinated efforts to increase customer awareness of CO
- Increased usage & legislation for CO alarms
- Create a harmonised approach across all fossil fuels that could cause CO incidents (Gas, Coal, Wood, Oil,....etc)
- Increasing awareness amongst the medical profession about the symptoms of CO exposure (similar to Flu)

- Improved training and accreditation of gas engineers (Gas Safe Register in UK)
- Positive impact of landlord certification
- Increased penetration of room sealed boilers / appliances
- Long run of relatively mild winters
- High level focus at government level including safety groups (APPGSG – All Party Parliamentary Gas Safety Group)

Natural Gas Carbon Monoxide Incident Fatalities



Graph of CO Statistics 1996 – 2014



CO Fatalities

The Department of Health estimates that there are 40 fatalities per year due to CO poisoning, yet the Downstream Incident Data Report (DIDR) states that there were three fatalities from piped natural gas and LPG in 2013/14.

Where are these additional deaths coming from?

Hot News

Date	Partial Post code	Age of victim	Sex	Appliance	Appliance age	Flue type	Factors reported
24/11/14	DT4	83 84	Male Female	Boiler floor standing	30 years	Open	Lack of servicing, ventilation blocked, bend on flue to close to boiler.
17/01/15	G44	85	Female	Boiler floor standing	36 years	Open	Lack of servicing and incomplete flue, some of the external flue was missing.
*27/11/14	B44	89	Male	Gas fire	n/k	Open	Flue blocked, no catchment space in builders opening, radiants damaged and installed upside down. Lack of servicing sited as contributory factor

*This incident is currently being reviewed by the HSE and their doctor as they had not recorded the cause as CO related. Information from the investigator was that the deceased had a COHb level of 24% and CO was spilling into the room.

Main Enablers for Change

- 1968 – 1972 : UK Conversion to natural gas
- 1986 – 1994 : Water Heater Safety Exercise
 - Removed 186,000 open flued water heaters from bathrooms and bedrooms
- 1990 onwards : Usage of flue gas analysers by operatives
- 1993 onwards : Usage of CO alarms began to increase
- 1996 : Landlords gas safety inspection & certificates legislation

Main Enablers for Change

- 1997 : British Gas began widespread promotion and installation of CO alarms (Approx. 300,000+ units per year)
- 2007 : Supplier Licence Review
- 2010 : Boiler Scrappage Scheme. Replaced old boilers with around 120,000 new 'A-rated' condensing boilers
- 2011 – GDNs started to use CO Measurement Devices
- Gas quality under Gas Safety Management Regulations 1996 & CE approved appliances

2011 Report

Recommendation 1

The Government should remove VAT on all carbon monoxide alarms.

Recommendation 2

Mortgage providers and estate agents should include a declaration that the property has a carbon monoxide alarm and that appliances have been serviced by a Gas Safe registered engineer (or similarly registered for other fossil fuel appliances) within the last year.

Recommendation 6

The Government should trial GPs prescribing a Gas Safety Check for suspected carbon monoxide cases.

Recommendation 7

The Government should ensure that all coroners' post-mortems routinely test for carboxyhaemoglobin levels, recording death from carbon monoxide poisoning as a distinct category and to notify this to a central register if a verdict is recorded only in the narrative section of the coroner's certificate.

Recommendation 8

Gas Distribution Networks should ensure that all Gas Emergency Service personnel are equipped with either personal carbon monoxide alarms, carbon monoxide detection equipment, or both.

Recommendation 14

The Government should update the Gas Safety (Installation and Use) Regulations 1998 to:

- a) Make mandatory the use of flue gas analysers for installation, commissioning and maintenance, where specified by the manufacturers' instructions (and manufacturers should ensure that those instructions are updated to reflect the latest British Standards).
- b) Include a full service of all appliances according to manufacturers' instructions.
- c) Require all rented properties to be fitted with an audible carbon monoxide alarm manufactured to the European standard EN 50921.

Recommendation 16

The Government should bring regulation for the whole fossil fuel sector in line with that of the gas industry.

2015 Report

Recommendation 2

The Cross Government Group on Gas Safety and CO Awareness should develop and adequately resource a coordinated data strategy for carbon monoxide incidents, impacts and responses, to be led by Public Health England and coordinated with current industry, academic and other efforts.

Recommendation 6

A single, coordinated carbon monoxide campaign brand, messaging, and set of materials should be developed and made freely available for use through a national, central portal. This could be related to a government department or a relevant emergency service such as Fire & Rescue, and should be coordinated with industry and charity campaigning efforts through the Carbon Monoxide All Fuels Action Forum.

Recommendation 8

The Gas Safety (Installation and Use) Regulations 1998 should be amended to introduce MOT-style (13-month validity) appliance servicing rules, allowing the same service date to be used annually.

Recommendation 9

Ofgem's Consumer Vulnerability Strategy should include within energy supplier Priority Services Register requirements, the provision and installation of Standard-compliant carbon monoxide alarms for vulnerable customers.

Recommendation 10

The UK Government should introduce a boiler replacement scheme with a view to Green Deal energy efficiency measures, tied in the first instance to the energy supplier Priority Services Register to target the most dangerous appliances in the most vulnerable situations.

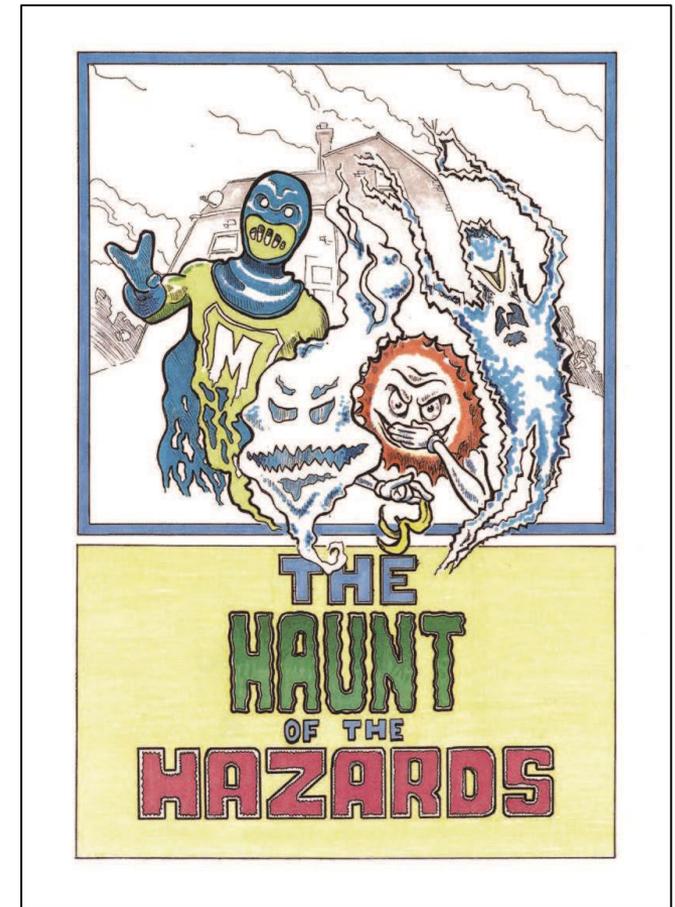
Recommendation 13

Providers of 'Home Care Plans' of annual heating system servicing and maintenance, should include carbon monoxide alarms as a 'default' option within each package.

Recommendation 20

Festival organisers should ensure that staff receive carbon monoxide promotional material and information during training, to enable them to act as trusted 'safety ambassadors' internal to the festival population and create a multiplier effect of safety awareness. Ambulance and medical staff at each festival should be a part of this process.

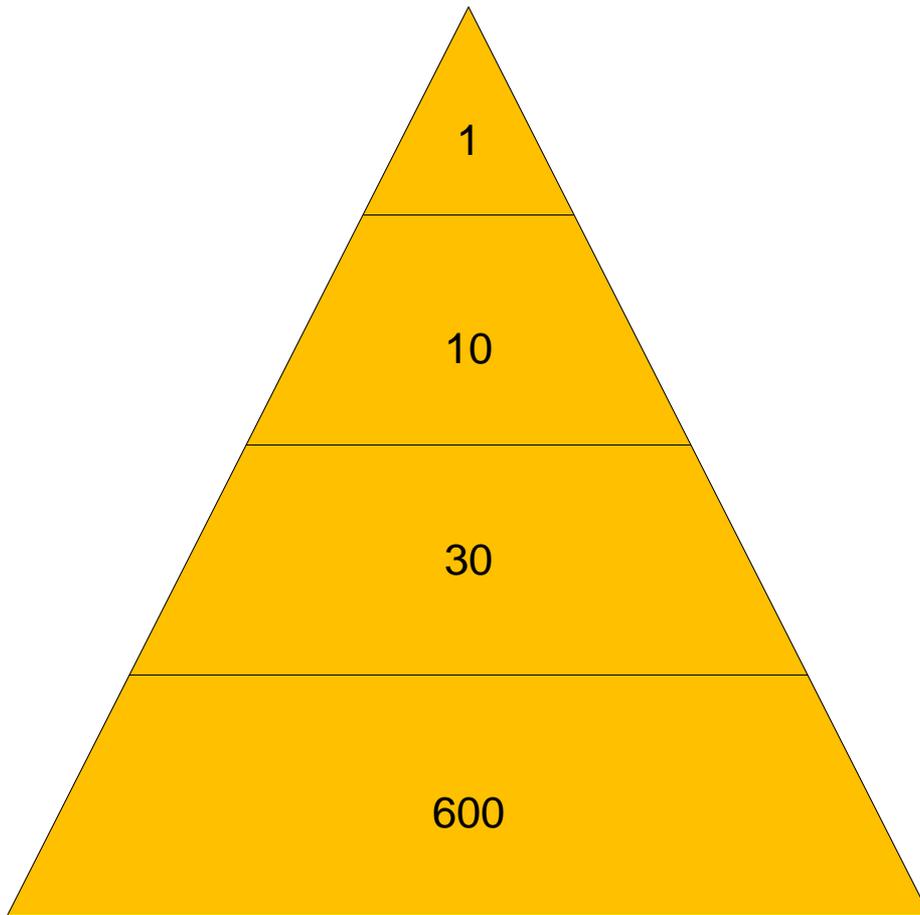
- Gas Safety Trust
 - ❖ Liverpool John Moores University and Fire & Rescue Service CO study
 - ❖ Cranfield University's CO+ Impact Study
 - ❖ Downstream Gas' GP Study
 - ❖ Public Health England's Coroner's Study
 - ❖ East of England Ambulance Service Pre-hospital Screening Study
 - ❖ Cranfield University's biomass combustion, environmental and health impact study
- Gas Industry Safety Group
 - ❖ Flues in Voids
 - ❖ *Haunt of the Hazards* comic book
- Marcogaz
 - ❖ CO Best Practice Guide



UK Statistics, Scale of the Problem

- Nobody really knows
- There is a large discrepancy for the number of incidents reported in the UK and across Europe
- The Department of Health estimates that there are 40 deaths per year due to CO
- Experts believe the real number is much higher
- Many incidents are not recognised as CO poisoning
- So what is being done to understand the scale of the problem?

The CO Problem in Context



- Serious or Major Injury
- Minor Injury
- Property Damage Accidents
- Incidents with no visible injury or Damage (Near accidents or close calls)

Questions

- What is the current population of smoke alarms in the UK?
- What is the current population of CO alarms in the UK?
- How many fatalities have there been where an active CO alarm has been installed?

This is the device that will wake you up and help save your life!

