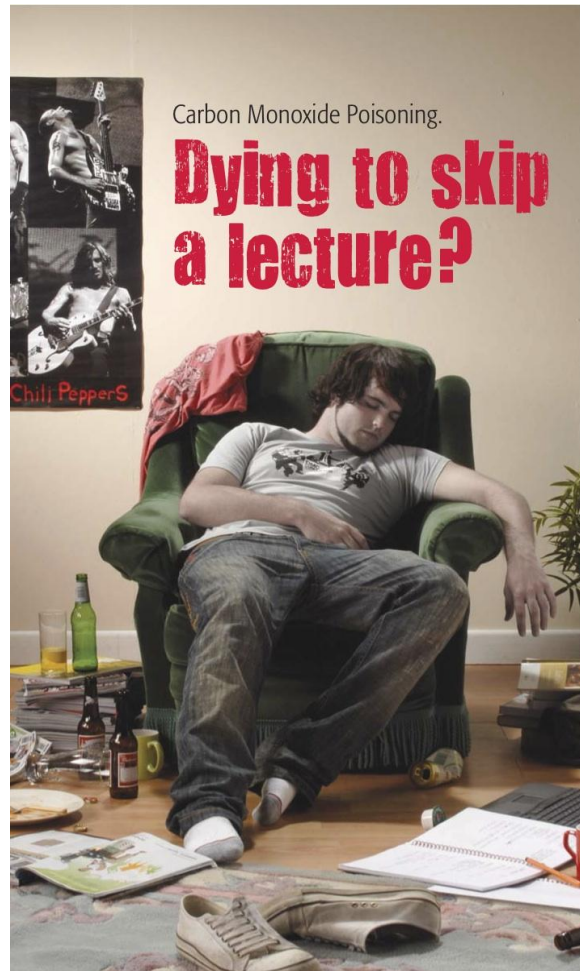


Report

Effectiveness of Campaigns on Carbon Monoxide Awareness Among Students in Private Rented Accommodation



A pilot study by the WHO Collaborating Centre for Housing Standards and Health

with funding from the Gas Safety Trust

THE UNIVERSITY OF
WARWICK



ACKNOWLEDGEMENTS

We are grateful for the support and assistance of those who made this project possible, in particular –

The Gas Safety Trust for supporting the study

Dave Crossan for the co-ordination, the interviews, and the seminar

Rob Nolan for help with the seminar

From Warwick University ~

Julie Cook, for administration

Susan Goodlad, for arranging the data entry and validation

Jas Bains, for help with the seminar

Service des Etudes Médicales d'EDF

Pierre-André Cabanes

Elisabeth Pigeon

We are also grateful to all those who agreed to take part in the survey.

David Ormandy, Véronique Ezratty, and Serge Koscielny

Warwick, December 2011

PILOT STUDY OF EFFECTIVENESS OF CAMPAIGNS ON CO AWARENESS AMONG STUDENTS LIVING IN THE PRIVATE RENTED SECTOR

CONTENTS

	Page
ACKNOWLEDGEMENTS	3
EXECUTIVE SUMMARY	7
INTRODUCTION	9
- Objectives	10
METHOD	11
- Questionnaires	11
- Interview Protocol	12
- Statistical Analyses	13
RESULTS	14
- Participants	14
- Campaigns, Information and Press Reports	15
MAIN FINDINGS	15
- Knowledge before Campaigns	15
- Effectiveness of Campaigns in Increasing Knowledge	16
- Effectiveness of Campaigns in Influencing Behaviour	18
DISCUSSION	18
- General Background	18
- Study Design	20
- The Results	20
CONCLUSION AND PERSPECTIVES	21
- Messages/Recommendations	21
REFERENCES	22
ANNEXES	23
1- Examples of Information, Campaigns and Media on CO and Gas Safety	25
2- Some CO interested National Organisations and Bodies	31
3- Student Population at Warwick University (2009)	35
4- Phase 2 Questionnaire	37

TABLES

	Page
TABLE 1 – THE CO RELEVANT QUESTIONS	14
TABLE 2 – CHARACTERISTICS OF PARTICIPANTS IN EACH PHASE	14
TABLE 3 – CORRECT RESPONSES TO SOME GENERAL SAFETY QUESTIONS	15
TABLE 4 – CORRECT RESPONSES TO CO SPECIFIC QUESTIONS	16
TABLE 5 – CORRECT RESPONSES TO TWO CO RELEVANT QUESTIONS, SCIENTIFIC VS NON-SCIENTIFIC STUDENTS	16
TABLE 6 – COMPARISON OF RESPONSES TO SOME OF THE CO RELEVANT QUESTIONS	17

PILOT STUDY OF EFFECTIVENESS OF CAMPAIGNS ON CO AWARENESS AMONG STUDENTS LIVING IN THE PRIVATE RENTED SECTOR

EXECUTIVE SUMMARY

Unintentional Carbon Monoxide (CO) poisoning in dwellings is a serious public health issue. Every year in the UK there are campaigns to raise awareness of the risks from CO, some aimed at the public generally, and others targeting groups seen as potentially vulnerable, such as university students. Unlike mass media campaigns on other health related topics, it appears that there has been little, if any, assessment of the effectiveness of these CO awareness campaigns.

The main objectives of this study were to assess –

1. The need for campaigns (ie, knowledge of CO before any campaigns).
2. The effectiveness of campaigns in increasing knowledge of CO, awareness of the dangers from CO, and in influencing behaviour.

The study targeted students of the University of Warwick (Coventry, UK), living in private rented accommodation. This pilot study was designed to be, as far as possible, impartial by adopting an approach that did not influence the respondents. Two sets of structured interviews were carried out in controlled conditions; one at the beginning of the University year in October 2009 (Phase 1), and the second at the end of the heating season in April/May 2010 (Phase 2). Trained interviewers used the same format and content for the interviews in both Phases. To avoid raising awareness of CO, the interviewers and participants were told that the study was about the indoor environment, and so 'blinded' to the main purposes of the study.

Between the two Phases, campaigns on CO awareness and gas safety were monitored, as were press reports on CO incidents.

The level of knowledge of CO and its dangers was assessed by analysing participants' responses to both general safety questions directly or indirectly relating to CO, and CO specific questions. Combined, these were the 'CO relevant questions'.

The mean proportion of correct answers to the 'CO relevant questions' in Phase 1 was 52% (N=441), although only 12% knew the unsafe colour of a gas flame. In Phase 2 (N=328), the mean proportion of correct answers to the 'CO relevant questions' increased significantly to 72%. There was an increase for almost all questions; for example those knowing the emergency telephone number rose from 29% to 74%. This was not so, however, for those knowing the unsafe colour of a gas flame, which remained low rising from 12% to 13%.

Among the 92 (28%) participants who said they recalled CO campaigns, television was the media most remembered. Only 11 of these 92 said they had changed their behaviour such as by fitting a CO detector.

The findings from this study show that the level of knowledge on CO in this student population before the campaigns was average. This supports the view that campaigns targeted at this population are needed. While the level of knowledge to the 'CO relevant questions' in Phase 2 had increased by more than 20%, it had not reached the 80% we consider high enough for sufficient public health protection. The results also showed that the impact of campaigns on CO awareness, and on the behaviour of this population could be improved.

Messages from this study among a student population

- Campaigns to raise awareness of the dangers from CO and to influence behaviour are necessary.
- There is a need to target campaigns at this particular population group.
- It should be recognised that television appears to be the media most remembered by this population.
- Monitoring is necessary to try to ensure the effectiveness of any such campaign.
- Students' Unions, Universities, and Accommodation Offices should consider –
 - Promoting campaigns through their web-sites, with particular emphasis on danger signs (eg, symptoms of CO poisoning and gas flame colour), and the telephone number for the emergency services.
 - Linking with other bodies and agencies, including landlords and managing agents, local authorities, Fire and Rescue services, the Health and Safety Executive, the Health Protection Agency, and Health Centres to co-ordinate promoting awareness.

PILOT STUDY OF EFFECTIVENESS OF CAMPAIGNS ON CO AWARENESS AMONG STUDENTS LIVING IN THE PRIVATE RENTED SECTOR

INTRODUCTION

Recognising that unintentional Carbon Monoxide (CO) poisoning in dwellings is a serious public health problem, there are annual campaigns to raise awareness. These campaigns run from autumn to the end of the heating season, some aimed at the public generally, and others targeting potentially vulnerable groups, such as university students. However, it appears that there has been little if any assessment of the effectiveness of such campaigns.

The acute health effects of CO poisoning are well documented (eg, Kao and Nanages, 2006; and Cho et al, 2008). At high concentrations, inhalation of CO can cause unconsciousness and death. At lower concentrations, inhalation can cause a range of symptoms from headaches, dizziness, weakness, nausea, confusion, and disorientation, to fatigue; all symptoms easily confused with those caused by illnesses such as influenza, and with depression.

Taking account of the dangers from CO, most European countries have adopted the World Health Organization and the Expert Panel on Air Quality Standards guidelines and standards for CO (WHO 1999, 2010 and EPAQS, 1998).

The main potential source of CO within dwellings is from the incomplete combustion of all fuels containing carbon, including gas, oil, and solid fuels. This may be a result of a malfunction or misuse of an appliance, or where there is inappropriate ventilation.

While countries may have information on the number of reported deaths attributable to CO poisoning, because of the possibility of misdiagnosis of non-fatal cases, the total burden of CO poisoning is uncertain. This is true in the UK as agencies collect data from different sources and by different methods. For example, in the year 2009/10, the Downstream Incident Data Report (DIDR, 2010) gives the numbers of deaths from CO poisoning as 7 and of injuries as 117 for England and Wales, while the National Health Service reports that there were more than 50 deaths and over 200 injuries – (<http://www.nhs.uk/Conditions/Carbon-monoxide-poisoning/Pages/Introduction.aspx>).

It has been assumed that students living in the private rented sector are a group potentially vulnerable to risks from CO. It is based on this assumption that some awareness campaigns target students (eg, the annual National Grid campaign on Facebook¹). The reasoning seems to be that students could be vulnerable because they can:

- be young and unaware of a lot of risks,
- be away from home for the first time,
- be from another country,
- suffer non specific symptoms that could be related to CO poisoning, and which could be mistakenly attributed to revising for and sitting examinations, or their lifestyle generally.

¹ National Grid is responsible for the energy distribution network in the UK. See Annex 1 for details of National Grid's campaign.

This pilot study was carried out among students at the University of Warwick (Coventry, UK) to investigate the need for, and the effectiveness of, campaigns on knowledge and behaviour relating to the risks from CO.

OBJECTIVES

The main objectives of this study were to –

1. Assess the level of knowledge on CO in a student population before any campaigns (ie, in October)
2. In April/May, assess whether campaigns –
 - a. increased significantly knowledge of CO
 - b. raised awareness of the dangers of CO, and
 - c. influenced behaviour

To meet these objectives and to be able to interpret the results, three end-points were devised. These were –

1) First End-Point – Assessment of Knowledge in a Student Population before the Campaigns

In October 2009, the level of knowledge of the students before the campaigns was assessed (Phase 1).

We considered that the need for the campaigns would be questioned where the level of knowledge in this student population was high before the campaigns were released (> 70% of good responses to the CO relevant questions – see Table 1).

2) Second End-Point – The Effectiveness of the Campaigns in Increasing Knowledge on CO

In April/May 2010 at the end of the heating season and the campaigns, the knowledge was reassessed (Phase 2).

We considered that the increase in the level of knowledge would be high enough if –

- a) the level of knowledge increased by at least 20% **absolute**

and

- b) was high enough, ie greater than 80% good responses to the CO relevant questions.

3) Third End-Point – The Effectiveness of the Campaigns in Influencing Behaviour

Also in Phase 2, participants were asked if they remembered campaigns, and if so, which were the media most remembered.

Those who remembered the campaigns were asked whether they had changed their behaviour and, if so, how.

METHOD

The study targeted Warwick University **students living in private rented accommodation** not managed by the University as such accommodation may have appliances that could produce CO if not properly maintained². Two sets of structured interviews were carried out, Phase 1 in early October 2009, at the beginning of the University year, and Phase 2 at the end of the heating season in April/May 2010. The interviewers were University students, recruited by word of mouth. Interviewees were to be recruited by adverts on the University intranet and notices in public places around the University. In addition, emails were sent to all 6,421 students registered with the University as living in private rented accommodations. As adverts and notices produced very few responses in Phase 1, only the emails were used to recruit students for Phase 2.

Between the interviews for Phase 1 in October 2009, and those for Phase 2 in April/May 2010 **campaigns on CO awareness** and gas safety were **monitored**. This included checking for details of any national campaigns, any campaigns local to the University of Warwick and those directed at the student population generally. **Press coverage of CO incidents** was also monitored.

To try to avoid involvement in the study raising CO awareness, both **the interviewers and interviewees were 'blinded' to the main purpose of the study**, being told that the survey was to assess knowledge on the indoor environment.

To assess whether being involved in Phase 1 may have influenced knowledge and/or awareness, **new students** were recruited for Phase 2, and their responses compared with those who had been interviewed in both Phase 1 and Phase 2.

The **University of Warwick Ethics Committee** approved the study.

QUESTIONNAIRES

Questionnaires were devised to be used by the interviewers as the basis of the structured interviews (see Annex 4). To maintain that the interview would appear to be about the indoor environment, **questions relevant to knowledge and awareness of carbon monoxide were mixed in with other questions**, including questions on other possible indoor pollutants.

Drafts of the Phase 1 questionnaire were tested by volunteers who would not be involved in the study process. These tests helped to ensure that the questions were clear and unambiguous, and, importantly, that it was not apparent that the study was about CO.

The questionnaire was divided into five sections. The cover page, as well as the date and the code for the interviewer, collected personal details, including name, student number, address, contact details, etc, of the interviewee. A unique code was given for each respondent, and the cover page was to be removed before data-entry to anonymise the results, as required by the University Ethics Committee. These personal details were used only to allow for matching of respondents who took part in both Phase 1 and Phase 2 of the study.

² See Annex 3 for details of the student numbers at the University.

Part 1 of the main questionnaire dealt with the individual, with questions about age, smoking habits, nationality and study subject.

Part 2 covered some basic information about the accommodation the respondent was occupying; whether it was a room in a shared house (shared with other students), a room in a purpose-built block with shared facilities, or a self-contained apartment.

Part 3 focused in more detail on the accommodation and the use made of it. Included in this part were some questions on **general safety as well as ones specific to CO**. There were questions on the time spent in the accommodation, on the form of space and water heating, the type of cooking facilities, whether a smoke detector, **carbon monoxide detector**, or burglar alarm were fitted, and the means of ventilation in particular rooms. There were also questions on who was responsible for maintenance of the heating and cooking appliances, what action to take if there was a problem with the indoor air quality, and what was the **telephone number for the emergency services**.

Part 3 then went on with specific questions on possible indoor pollutants – Dampness and Mould; Oxides of Nitrogen; **Carbon Monoxide**; and Formaldehyde. For these pollutants the questions were identical, starting with whether it could be found in dwellings. Where there was a positive response, further questions were asked, including, whether it could affect health, and if so, the severity of that effect. There were also multiple choice questions on the type of health effects (including some that could not be caused by any of these pollutants), the possible sources, and where the respondent had learnt about that pollutant.

Part 4 of the Phase 1 questionnaire simply asked whether the interviewee would be prepared to take part in Phase 2 around April/May time in 2010.

The questionnaire for **Phase 2 was identical, except for Part 4**. This started by asking whether the interviewee **recalled any CO awareness campaigns**, and if so, what was the media they remembered. Where they remembered the campaigns, they were also asked whether they had **changed their behaviour, and if so, how**.

INTERVIEW PROTOCOL

Five University students were recruited to carry out the interviews, one of whom was to act as co-ordinator and supervisor for the interviews.

A briefing session for the co-ordinator and interviewers was arranged one week before the start of the study. The briefing explained how the interviewees were to be identified, and the interview process. The interviewers were told to introduce the interview by explaining that the aim was to gather information on the indoor environment of the accommodation where students were living. The questionnaire was to be used as the basis of a structured interview, and for the interviewer to record the answers. The interviewers were instructed not to help or suggest answers, although where necessary pictures of appliances (eg, hobs, ovens etc.) could be shown. To complete the controlled conditions, rooms were arranged for the interviews.

A similar briefing session was arranged one week before Phase 2 of the study, in April 2010. The interviewers were reminded that they must not prompt the respondents, and again it was stressed that they should inform the respondents that the interview was about the indoor environment generally. However, as there were

additional questions on CO Awareness Campaigns at the end of the Phase 2 interview, the interviewers were instructed to read out the following statement at the close of the interview –

‘This survey aims to assess what people know about indoor air quality, and, for it to be effective, it is important that you do not discuss what is covered with anyone who has not yet taken part.’

STATISTICAL ANALYSES

Although the interviews covered several pollutants and some information on general safety and the indoor environment, only the ‘CO relevant questions’ (see Table 1) were analysed. These were both general safety questions directly or indirectly relating to CO (see Table 1(a)) and CO specific questions (see Table 1(b)).

For each question the proportion of correct answers was estimated. Where there were multiple choices, only when correct answers and no others were given, was the answer considered correct. When “don’t know” was an option it was considered as a wrong answer. For each question the proportions of correct answers to Phase 1 and Phase 2 were compared with a Chi-Square test. P-values less than 0.05 were considered statistically significant.

3.6	Would any of these be a sign of a problem with a gas appliance? Blue flame <input type="checkbox"/> Green flame <input type="checkbox"/> Orange flame <input type="checkbox"/> Don't know <input type="checkbox"/>
3.8.3	If you had a problem with any heating and/or cooking appliance – Who would you contact? (tick one only) Landlord/Agent <input type="checkbox"/> A heating/gas engineer <input type="checkbox"/> Local authority <input type="checkbox"/> Parents <input type="checkbox"/> Don't know <input type="checkbox"/> Other <input type="checkbox"/> Specify _____
3.8.4	Is there a problem with your cooking or heating appliances? Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/>
3.8.6	If you suspected there was an immediate problem with the indoor air quality, what would you do? (tick all that apply) Call the Landlord/Agent <input type="checkbox"/> Open windows <input type="checkbox"/> Turn off the cooking/heating appliances <input type="checkbox"/> Call an emergency number <input type="checkbox"/> Go outside until you are told it is safe to return <input type="checkbox"/> Call your parents/a friend <input type="checkbox"/> Call the local authority <input type="checkbox"/> <input type="checkbox"/> Other <input type="checkbox"/> Specify _____ Don't know <input type="checkbox"/>
3.8.7	Do you know the telephone number for the landlord? Yes <input type="checkbox"/> No <input type="checkbox"/>
3.8.8	Do you know the emergency telephone number? Yes <input type="checkbox"/> No <input type="checkbox"/>
3.8.9	If “yes” to 3.8.8, specify which is correct (tick all that apply) 999 <input type="checkbox"/> 0800 111 999 <input type="checkbox"/> 112 <input type="checkbox"/> 911 <input type="checkbox"/>
3.11	Is there a carbon monoxide detector fitted? Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/>
3.13	Is a garage connected to your accommodation/house? Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/>

Table 1(a) – General Safety Questions Directly or Indirectly relating to CO in the Questionnaires

3.17	Can Carbon Monoxide be found in dwellings? Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/>
3.17.1	Does it have a smell? Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/>
3.17.2	Can you see it? Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/>
3.17.3	Can it affect your health? Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/>
3.17.3.1	If “yes” to 3.17.3 using a scale of 1 to 5 (1 for mild and 5 for fatal) how serious can the health effects be ? <input type="checkbox"/>
3.17.3.2	If “yes” to 3.17.3 what are the health effects? (tick all that apply) Breathing difficulties <input type="checkbox"/> Chest pains <input type="checkbox"/> Eye irritation <input type="checkbox"/> Tiredness <input type="checkbox"/> Headaches <input type="checkbox"/> Dizziness <input type="checkbox"/> Ear ache <input type="checkbox"/> Nausea/vomiting <input type="checkbox"/> Rash <input type="checkbox"/> Don't know <input type="checkbox"/>
3.17.3.3	What are the possible sources? (tick all that apply) Pollution from outside (eg. Traffic) <input type="checkbox"/> Carpets and furnishings <input type="checkbox"/> Combustion (eg. Cooking, heating appliances) <input type="checkbox"/> Don't know <input type="checkbox"/>

Table 1(b) – CO Specific Questions in the Questionnaires

Table 1 – The CO Relevant Questions**RESULTS****PARTICIPANTS**

In Phase 1 there were 441 participants. Of these, 264 (60%) were British, and 177 (40%) International. There were 249 male, and 191 female students interviewed; the majority being between 20 and 25 years old. Of the original students taking part in Phase 1, 193 were re-interviewed in Phase 2 together with an additional 135 new students who had not taken part in Phase 1 (see Table 2).

The total number interviewed in Phase 2 was 328, and, similar to Phase 1, of these 189 (58%) were British and 139 (42%) international students. There were 157 male, and 171 female students interviewed; again the majority were aged between 20 and 25.

	Phase 1 (N=441)	Phase 2 (N=328)	Phase 1 only (N=248)	Phase 2 only (N=135)	Both Phases 1 and 2 (N=193)
Under 20	161 (37%)	62 (19%)	100 (40%)	24 (18%)	99 (26%)
20-25	220 (50%)	208 (63%)	122 (49%)	90 (67%)	216 (56%)
26-30	38 (9%)	31 (9%)	16 (6%)	8 (6%)	45 (12%)
Over 30	22 (5%)	27 (8%)	10 (4%)	13 (10%)	26 (7%)
International	177 (40%)	139 (42%)	93 (38%)	59 (44%)	164 (42%)
British	264 (60%)	189 (58%)	155 (63%)	76 (56%)	222 (58%)
Arts	72 (16%)	62 (19%)	32 (13%)	23 (17%)	79 (21%)
Medicine	7 (2%)	1 (0%)	5 (2%)	0 (0%)	3 (1%)
Science	187 (43%)	130 (40%)	125 (51%)	55 (41%)	137 (36%)
Social Science	171 (39%)	133 (41%)	82 (34%)	57 (42%)	165 (43%)

Missing data excluded

Table 2 – Characteristics of Participants in each Phase

CAMPAIGNS, INFORMATION AND PRESS REPORTS

Information relating to CO and gas safety was collected between October 2009 and April 2010, and media (including newspapers and the internet) was monitored. The information collected included –

- Information given to students by the University's Accommodation Office and by the Warwick Students' Union. This information is provided to each student when they start at the University and again when they move off campus to rent private accommodation. This includes some information on gas safety and CO, and check-lists to be used when viewing possible accommodation.
- Two campaigns specifically targeted students. One was released by the Health and Safety Executive and included leaflets and posters; the other was run by National Grid on the social network site 'Facebook'.
- During the 2009/10 heating season, other bodies and agencies, including CO-Awareness and Health Protection Agency, ran national campaigns aimed at the public generally.
- As well as campaigns there were various press reports on incidents of CO poisoning, and at least one information piece on a day-time television programme.

A range of the information, campaigns and some press coverage is summarised in Annex 1.

MAIN FINDINGS

1) First End-Point – Assessment of Knowledge in this Population before the Campaign(s)

In October 2009 (Phase 1), the mean proportion of correct answers to the CO relevant questions was **52%** (N=441).

Table 3 shows the mean percentage of correct responses to some of the questions about general safety.

	Mean Percentage
Knowledge of possible problems with a cooking or heating appliance	93%
Knowing if there is a CO detector fitted	55%
Correct actions to take if a problem with indoor air quality was suspected	43%
Knowing the telephone number for the landlord	37%
Knowing the telephone number for the emergency services	29%

Table 3 – Correct responses to Some General Safety Questions Directly or Indirectly relating to CO

The respondents were given four telephone numbers and asked which were correct for the emergency services. Of the 441, 128 (29%) responded; 104 gave 999, which was the correct number for any of the emergency services (eg, fire, police and/or ambulance), 5 gave 0800 111 999, which was for gas safety specific emergencies; and 2 gave 112,. The number 112 has now been introduced as the emergency service number throughout Europe but was not adopted in the UK until February

2010, so not available during Phase 1 in October 2009. Another 7 gave 911, which is the emergency number in North America, but not in the UK.

Table 4 shows the mean percentage of correct responses to CO specific questions.

	Mean Percentage
Knowing that CO can affect health	56%
Knowing that CO can be found in dwellings	56%
Knowing that CO cannot be seen	55%
Knowing CO does not have a smell	47%
Knowing the dangerous colour of a gas flame	12%

Table 4 – Correct responses to CO Specific Questions

The knowledge of some CO relevant questions among the groups of students studying ‘scientific’ subjects – Medicine and Science – compared with those studying ‘non-scientific’ subjects – Arts and Social Sciences – showed inconsistencies (see Table 5).

Questions	Percentage Scientific vs Non-Scientific
Knowing the correct action to take if there is a problem with indoor air quality	53% vs 36%
Knowing that CO can be found in dwellings	47% vs 62%

Table 5 – Correct responses to two CO relevant Questions, Scientific vs Non-Scientific Students

The percentage of those in Phase 1 (N=441) knowing that CO could be fatal was 47%, and the percentage knowing possible sources of CO was 50%.

2) Second End-Point – The Effectiveness of the Campaigns in Increasing Knowledge on CO

The responses for the ‘CO relevant questions’ for both kinds of participants in Phase 2 according to their participation or not to Phase 1, are reported in Table 6 with p values for each comparison –

- Those interviewed in Phase 1 (N=441) with those interviewed in Phase 2 (N=328).
- Those interviewed in both Phases (N=193) with those interviewed only in Phase 2 (N=135).
- The responses from Phase 1 with the responses from Phase 2 of those interviewed in both Phases (N=193).

	Responses in Phase 1 vs responses in Phase 2			Responses in Phase 2 of those interviewed in both Phases vs those who only took part in Phase 2			Responses of those who took part in both Phases		
	Phase 1 (N=441)	Phase 2 (N=328)	P value	Phase 1 and 2 (N=193)	Phase 2 only (N=135)	P value	Phase 1 (N=193)	Phase 2 (N=193)	P value
General Safety Questions Directly or Indirectly relating to CO									
Is there a problem with your cooking or heating appliances?	93%	98%	0.0004	98%	99%	0.69	97%	98%	0.52
Is there a CO detector fitted?	55%	61%	0.11	61%	61%	0.98	52%	61%	0.08
What action would you take if you suspect a problem with the indoor air quality?	43%	98%	0.0000	98%	97%	0.40	32%	98%	0.0000
Do you know the telephone number for the landlord?	37%	88%	0.0000	88%	88%	0.99	26%	88%	0.0000
Do you know the telephone number for the emergency services?	29%	74%	0.0000	74%	74%	1.00	22%	74%	0.0000
CO Specific Questions									
Can CO affect your health?	56%	71%	0.0000	70%	72%	0.79	64%	70%	0.16
Can CO be found in dwellings?	56%	70%	0.0000	71%	70%	0.79	63%	71%	0.10
Does CO have a smell?	47%	59%	0.0000	64%	50%	0.01	54%	64%	0.05
Can you see CO?	55%	69%	0.0000	70%	68%	0.73	61%	70%	0.05
What is the dangerous colour of a CO flame?	12%	13%	0.99	15%	10%	0.19	15%	15%	1.00
Can CO be fatal?	47%	56%	0.02	56%	56%	0.94	54%	56%	0.76
Knowing possible sources of CO	50%	66%	0.0000	66%	65%	0.83	58%	66%	0.08
Overall mean correct responses to the CO relevant questions	52%	72%	0.0000	73%	71%	0.29	53%	73%	0.0000

Table 6 – Comparison of Responses to some of the ‘CO relevant questions’

In Phase 2, the overall rate of correct answers from those re-interviewed (N=193) and new interviewees (N=135) were not significantly different ($p=0.29$), being 73% for those who participated to both Phases versus 71% for those who participated to Phase 2 only. This showed that involvement in Phase 1 had had no significant influence on the participants. It also allowed us to combine the responses from both these groups and increase the power of the analyses.

When the responses from those re-interviewed and the new interviewees in Phase 2 were combined, the mean proportion of correct answers to the 'CO relevant questions' increased significantly to **72% (N=328) in Phase 2 from 52% (N=441) in Phase 1.**

A significant increase of knowledge was observed between the two phases for all CO relevant questions but two: 'Knowing if there is a CO detectors fitted' and 'Knowing the dangerous colour of gas flame'. For instance, the percentage who stated that CO could be found in dwellings rose to 70% in Phase 2 from 56% in Phase 1. There was also a rise in the percentage who said that CO could affect health, to 71% in Phase 2 from 56% in Phase 1. There was a significant increase in the percentage answering that CO could be fatal between the two Phases, 56% in Phase 2 from 47% in Phase 1.

3) Third End-Point – The Effectiveness of the Campaigns in Influencing Behaviour

In Phase 2, 92 (28% of the 328) said that they recalled CO campaigns; and of these 92, 13 (14%) said that they remembered the latest campaigns. Asked what media they remembered, 71 (77%) of the 92 said it was **television**, 21 (23%) said newspapers, and 19 (21%) said the internet (more than one response could be given).

Of the 92 respondents who remembered the CO campaigns, **26 (28%) said that they had changed their behaviour.** When asked how they had changed their behaviour, 15 (58%) said they intended to do something or that they were more aware, and 11 (42%) said they had done something such as fitting a CO detector.

DISCUSSION

GENERAL BACKGROUND

Although every year there are regular campaigns on CO awareness in England (and in other countries), as far as we know, there are no published studies into the effectiveness of such campaigns. There are, however, works on the theory, research and experience of campaigns (Rice and Atkin 2001) and papers on the effectiveness of mass media campaigns on different environmental and public health related topics (Fitzpatrick-Lewis et al 2010, and Wakefield et al 2010).

One systematic review focused on communication about environmental health risks, including radon, chemical spills, natural disasters, bioterrorism and infectious diseases (Fitzpatrick-Lewis et al, 2010). Another reviewed the effectiveness of mass media campaigns to influence healthier behaviour (Wakefield et al, 2010). This second review assessed studies into campaigns covering three types of issues – those aimed at actions that put health at risk (such as tobacco, alcohol and drug use,

and sex-related behaviour) and which may be felt to give pleasure (a selfish and perhaps immediate benefit), those that are to persuade individuals to check if their health is at risk (like screening for cancer, and vaccination), and those to persuade adoption of actions to protect health (such as wearing car seat-belts).

These reviews found that the impact or effectiveness of campaigns is affected by personal risk perception, previous personal experience with emergencies, and trust in the source of information. This last point suggests that health care professionals, who are generally trusted, could have an important role communicating risks and preventative measures, reinforcing the impact and effectiveness of campaigns (Marchwinska-Wyrwal et al, 2011).

Although finding that primary studies assessing the effectiveness of campaigns were generally of poor methodological quality, one review concluded that how messages are delivered is important (Fitzpatrick-Lewis et al, 2010). This included finding that adopting strategies that recognise the needs of the target audience, incorporating personal inter-action, and using various methods of delivery mean that messages are likely to reach the largest audience. It also recommended that the messages should be based on sound research of the target audience and be tested throughout the campaign development.

The other review (Wakefield et al, 2010), found that campaigns are likely to be more successful if there are multiple interventions, and that the accessibility of and access to relevant services and products are necessary so that individuals can act on the messages. They also suggested that news and entertainment media covering public health issues represent a promising complementary strategy to campaigns.

For CO, there are specific considerations to take into account. In our view, campaigns on CO have to address three dimensions to be effective – knowledge of the dangers from CO; awareness that everyone could be at risk and that change of behaviour is necessary; and behaviour change.

A minimum of knowledge about CO is needed because it is insidious – it cannot be seen, smelt, tasted or heard – but it can be fatal. This knowledge of the risk needs to be supplemented with the recognition by the individual that the risk of exposure can affect her/him and their household, that the source may be from an adjacent property, and that precautionary measures are necessary.

Knowledge of the risks from CO may not be enough. A telephone survey was carried out in France involving over 6,000 telephone interviews of a random representative sample of people aged between 18 and 75 years (Girard et al, 2008). This survey found that the vast majority, over 75%, knew about CO and that it was a serious problem. However, only 11% thought that CO poisoning could happen to them, and over 77% of those with at least one potential CO source in their home did not consider they were at risk.

The findings from this French study support the idea that the important public health messages to be promoted are that everyone is at risk of exposure, that the source may be from another property, and that precautionary measures are necessary. The findings also suggest that campaigns should recognise that knowing that some action or precaution should be taken does not mean that it is taken, and so should emphasise simple preventative measures and actions to take in case of the possibility of exposure.

THE STUDY DESIGN

We believe that the design of this study is original in assessing the effectiveness of campaigns, the methodology adopted minimising bias. Options such as self-completed paper questionnaires or web-based surveys, which could have meant a higher number of responses, were discounted because of the possibility of participants checking responses with other people or looking-up the answers. 'Blinding' the interviewers and interviewees to the main purpose of the study, and carrying out the interviews in controlled conditions ensured that it was the current knowledge of the respondents that was being collected. Using structured interviews meant that the same information was collected in both Phases allowing comparison between individuals and between the two Phases. This two-stage approach was intended to avoid the possible influence of a single-stage follow-up survey that named the campaign or topic.

THE RESULTS

The level of knowledge about CO in this student population before the campaigns, ie, in Phase 1, was average (52%, N=441). Because of the design of our study this could be close to reality. However, the participants were volunteers who responded to an invitation to take part in a study on the residential indoor environment, and so it cannot be assumed that they were representative of the student population as a whole. It should be noted that there was a high proportion of international students involved in both Phases of this study (40% and 42%) although they make up only around 24% of the total student population at Warwick.

It is not clear why there was a low response for Phase 2 from those who were involved in Phase 1 even though nearly all had agreed to take part in Phase 2. One possibility is that, as the participants were unaware of the underlying purpose of the survey, there was no obvious 'intervention' or event between the two Phases, so there may have seemed little point in taking part again.

New students were recruited for Phase 2 to test whether involvement in Phase 1 had influenced knowledge. The mean proportion of correct responses to the 'CO relevant questions' from those re-interviewed in Phase 2 (N=193) and the new interviewees in Phase 2 only (N=135) was not significantly different. This showed that involvement in Phase 1 had had no significant influence. The one question with a difference between the two groups concerned whether CO has a smell ($p=0.01$). However, this is the only significant difference between the two groups; and since sixteen questions had been asked, with a $p=0.05$ alpha level, one significant difference was to be expected out of the sixteen comparisons.

The lack of significant differences in the responses from the two groups also allowed the answers from both groups to be combined, so increasing the statistical power of the comparisons.

The level of knowledge to the 'CO relevant questions' in Phase 2 compared with Phase 1 had increased by more than 20% (22% absolute). This increase could have been a result to a greater or lesser extent of campaigns, even though a low percentage (28%) said they remembered them.

A factor contributing to the increase in knowledge on general safety matters may be that students would have become more familiar with the accommodation by April (they would have moved into it in October 2009, just before Phase 1). This means that they would be more likely to know the landlord's telephone number (88% vs

37%), and the presence of detectors (61% vs 55%). Also, Phase 2 was after a winter and the students would have become more familiar with the heating appliances.

There was a significant increase in those knowing the telephone number of the emergency services (74% in Phase 2 from 29% in Phase 1). However, it is surprising that, as they had been attending the University for at least two years before moving off campus, there was such a low response to this question in Phase 1. Knowing the emergency telephone is important not just for CO, but also for other emergencies (such as fire and medical crises), and not just important while a student, but important throughout life in this country and anywhere else. That many different countries have different emergency numbers could have contributed to the confusion. This may now be overcome as the European Union now requires all European countries to make 112 the number for any of the emergency services³, although the effect of this is something to be confirmed.

While there was an overall increase in knowledge between the two Phases, there was no increase to the question on the dangerous colour of a gas flame (less than 15% in both phases), even though most campaigns highlight the gas flame colour. This is of concern as CO cannot be seen or smelt, and, without a CO detector fitted, the flame colour may be one important clue that there is a possible risk of exposure to CO.

Conclusion and Perspectives

The level of knowledge about CO in this student population before the campaigns (ie, in Phase 1) was found to be average. As there was less than 70% of good responses, a level above which we consider the need for campaigns could be questioned, therefore, it is concluded that **campaigns targeted at this population are needed.**

While the level of knowledge to the CO specific questions in Phase 2 had increased by more than 20%, it had not reached the 80% we considered high enough for sufficient public health protection for this kind of risk. In addition, the results show that an increase in knowledge did not necessarily translate into an increase in CO awareness, or the adoption of precautionary behaviour in this population. **Therefore the impact of campaigns on the knowledge, awareness, and behaviour of this population of students could be improved.**

MESSAGES/RECOMMENDATIONS

Based on the findings from this study, the following recommendations are made –

- As well as targeting campaigns for specific audiences, monitoring will help ensure that the campaigns are informing and influencing the intended audiences.
- National and local campaigns could be promoted through University web-sites and posters and leaflet could be made more widely available throughout Universities.
- It should be recognised that television is the most remembered source of information on CO campaigns for this particular population group.

³ http://ec.europa.eu/information_society/activities/112/index_en.htm

- Students need clear and straight-forward safety instructions about gas appliances and the risks from CO, including advice about what to do in the event of a CO detector raising the alarm, and advice on symptoms that could suggest exposure.
- Students, particularly international students, need to be made aware of the telephone number for the emergency services.
- There are a large number of bodies with responsibilities for, or interests in, preventing CO poisonings. There is a need for co-ordination between Universities and bodies such as, local authorities, Fire and Rescue Services, the Health and Safety Executive, estate agents, landlords' associations, and health centres that cover the area where students will look for accommodation.
- Ideally, all accommodation for students should be fitted with working CO detectors.
- It should be recognised that doctors and health care personnel could have an important role in raising CO awareness and in promoting campaigns.

REFERENCES

- Cho CH, Chiu NC, Ho CS, Peng CC. (2008). Carbon monoxide poisoning in children. *Pediatr Neonatol.* Aug;49(4):121-5.
- DIDR (2010). The United Kingdom's Official Incident Data Report focusing on carbon monoxide deaths and serious incidents from piped natural gas and liquid petroleum gas (LPG) during 2009/10. Gas Safety Trust, Basingstoke, UK
- EPAQS (1998) A Recommendation for a United Kingdom Air Quality Standard for Carbon Monoxide. Expert Panel on Air Quality Standards.
- Fitzpatrick-Lewis D, Yost J, Ciliska D, and Krishnaratne S (2010). Communication about environmental health risks: A systematic review. *Environmental Health*, 9:67.
- Girard D, Leon C, Gourier-Frery C (2008). Monoxyde de carbone. In: Menard C, Girard D, Leon C, Beck F. *Baromètre santé environnement 2007*. Saint Denis: INPES, 2008 : 191-211.
- Kao LW, Nanagas KA. (2006). Toxicity associated with carbon monoxide. *Clin Lab Med.* Mar;26(1):99-125.
- Marchwinska-Wyrwal E, Teaf CM, Dziubanek G, and Hajok I (2011) Risk assessment and risk communication in environmental health in Poland. *EJPHA*, advanced access, 22-08-2011.
- Rice RE and Atkin CK (eds) (2001). *Public Communication Campaigns*. Sage Publications, London.
- Wakefield MA, Loken B, and Hornik RC (2010). Use of mass media campaigns to change health behaviour. *Lancet*; 376:1261-71.
- WHO (1999). *Environmental health criteria 213:carbon monoxide (2nd edition)*. Helsinki: World Health Organization; 1999.
- WHO (2010). *Guidelines for indoor air quality: selected pollutants*. Copenhagen: World Health Organization; 2010.

ANNEXES

TO

REPORT

**PILOT STUDY OF EFFECTIVENESS OF CAMPAIGN(S) ON CO AWARENESS AMONG
STUDENTS LIVING IN THE PRIVATE RENTED SECTOR**

ANNEX 1

EXAMPLES OF INFORMATION, CAMPAIGNS AND MEDIA COVERAGE ON CO AND GAS SAFETY BETWEEN OCTOBER 2009 AND APRIL 2010

National Grid Survey of Students

In September 2008, National Grid, which operates the national transmission system for gas throughout the UK, reported on a web-based survey of students carried out by 'Tickbox'. There were 1096 responses to the survey carried out between 3 and 10 September 2008.

In 2009 the findings from this survey were given as –

- 72% do not know what steps to take in the event of a gas leak
- Over half (54%) of respondents would not know who to call if they had a gas escape
- 42% do not know how to turn off their gas, electricity or water from the mains supply
- Over a third (40%) believe that it is the landlords responsibility for the safety of student accommodation; just under a third (32%) believe it is the universities
- Only 20% have checked / will be checking that a CO alarm (audible) is present in their accommodation
- 48% would ask their landlord to fit a smoke alarm if it wasn't present
 - 40% would ask for a fire alarm
 - but only 10% would ask for a CO alarm
- Almost 50% do not know the signs of a faulty gas appliance
- The top 3 reasons for choosing university accommodation are: rent (90%), location (82%) and quality of the area (63%)
- 18% chose accommodation if a gas safety certificate is available from landlord
- 11% chose accommodation if CO alarms were fitted

Some Press Coverage during 2009/2010

A press release was issued on **13 August 2009** –

“When six Oxford University students were encouraged by their parents to fit a carbon monoxide (CO) alarm in their student digs, little did they know it would save their lives. The alarm signalled, warning them of high levels of carbon monoxide leaking from a gas cooker in their rented house.”

BBC Television News reported on **24 September 2009** that an Inquest into the deaths of two teenagers found the cause to be faulty burns and the misuse of a portable gas heater in a summer house.

On **5 October 2009**, National Grid issued a news release announcing the start of their media campaign to raise CO awareness amongst students. The campaign included use of Facebook, MSN, and Yahoo. The campaign involved an actor from a television soap considered popular with students, and leaflets. University Students' Union web-site were encouraged to take up the campaign.

A Stakeholder event was organised by Gas Safe Register on **21 October 2009** at Central Hall, Westminster. The main message was to warn the public against using unregistered (illegal) gas engineers. There followed a campaign including advertisements on 30 television channels for two weeks, items on national and local radio stations, a web-site, and leaflets.

On **16 November 2009**, the Health Protection Agency issued a press release announcing the start of Carbon Monoxide Awareness Week. A main part of the campaign was to recommend fitting an audible CO detector. The campaign was supported by several local and national organisations.

The web-site of the Health and Safety Executive on **25 January 2010** made available a poster and a leaflet targeted at students with the headline “Will you wake up?”

The daytime television programme Good Morning carried a detailed and informative piece about CO on **1 February 2010**.

In **February** and **March 2010**, most daily newspapers carried reports on the Inquest into the deaths of two children at a holiday resort in Corfu. The cause of the deaths was CO poisoning from a faulty and badly fitted gas appliance.

Information on CO and Warwick University

Warwick Accommodation is the department within the University responsible for managing student halls of residence, and liaising with owners to manage houses for students. It also provides advice to students who will be living off-campus in the form of a web-based ‘handbook’. The section on ‘**Safety in the Home**’ includes advice on ‘Domestic Appliances’ and contains the following –

COOKERS - GAS

These Safety instructions should be read carefully.

Before use it is essential to carefully read the instructions.

Exercise the greatest care with children. Physical and electrical injury can occur if they are allowed freedom with such equipment. Allow children to use specific appliances only according to your knowledge of the age, wisdom and good sense of the child. Most of these appliances were not intended for “playing with” and all rely on parental supervision when used by children. Remember electricity can kill. Children may defeat basic safety precautions by poking things inside appliances through vents intended for cooling.

If the appliance is damaged in any way, switch off and disconnect the appliance and take professional advice before using it again.

No attempt should be made to remove covers in order to reach the wiring inside. Seek professional help instead.

Electrical equipment is usually constructed to conform to strict safety standards. You should not attempt to repair, maintain or modify it. Only genuine approved replacement parts should be used.

THIS APPLIANCE SHOULD BE EARTHED.

Electricity is dangerous. When using ANY electrical equipment at UK domestic mains voltage, (220v AC), or similar, remember that you are using a force that can kill or seriously injure you.

The appliance is heavy so, if it needs to be moved, do so with great care. Get help if you need it.

Do not use this appliance for any task for which it was not specifically designed. Physical injury and/or damage to the appliance may be result.

Under no circumstances must fingers or implements be poked into any openings in the case, or into any moving parts, whilst the electricity is turned on. To do so could lead to severe injury and/or severe damage to the equipment. If there is a valid need to extract some foreign matter from somewhere in the equipment SWITCH off and UNPLUG before doing so.

Make sure that, when installed, the machine is not standing on it's own cable as this would damage the cable.

The electricity in this appliance is only designed to run the clock and lights etc.

Gas also has safety requirement to avoid the danger of explosion or suffocation.

Warwick Students' Union Web-site has a page on **Housing Safety**. It starts with a reminder that the landlord should provide a copy of Gas Safety Certificate, and that only engineers registered with Gas Safe Register should be allowed to work on gas appliances. It also gives the following advice –

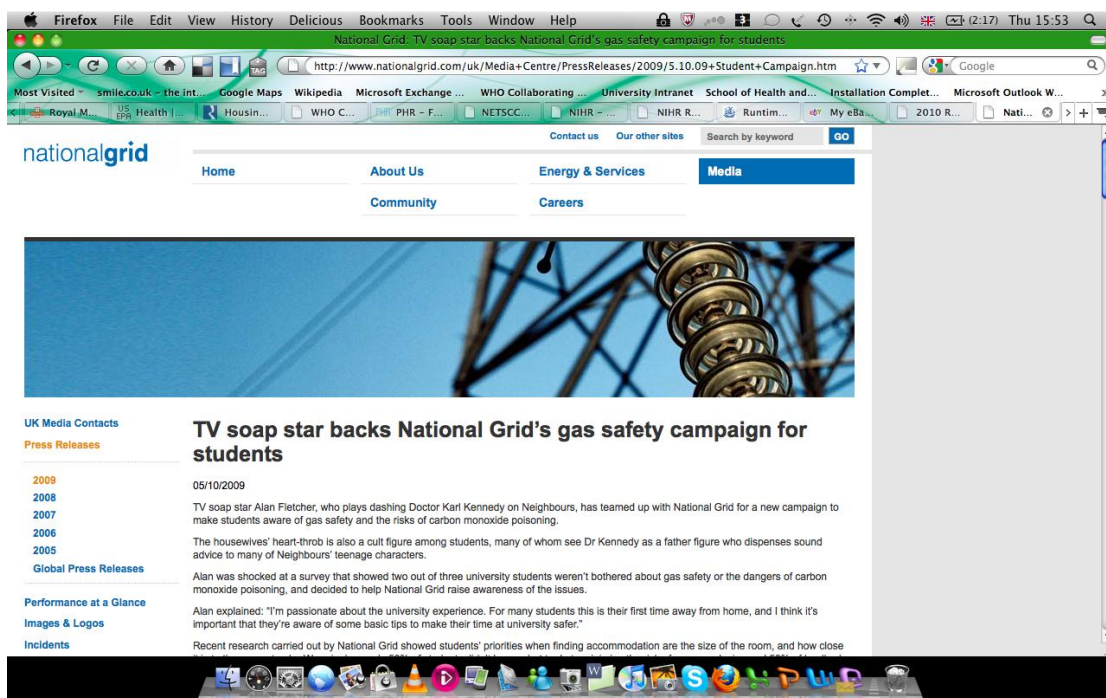
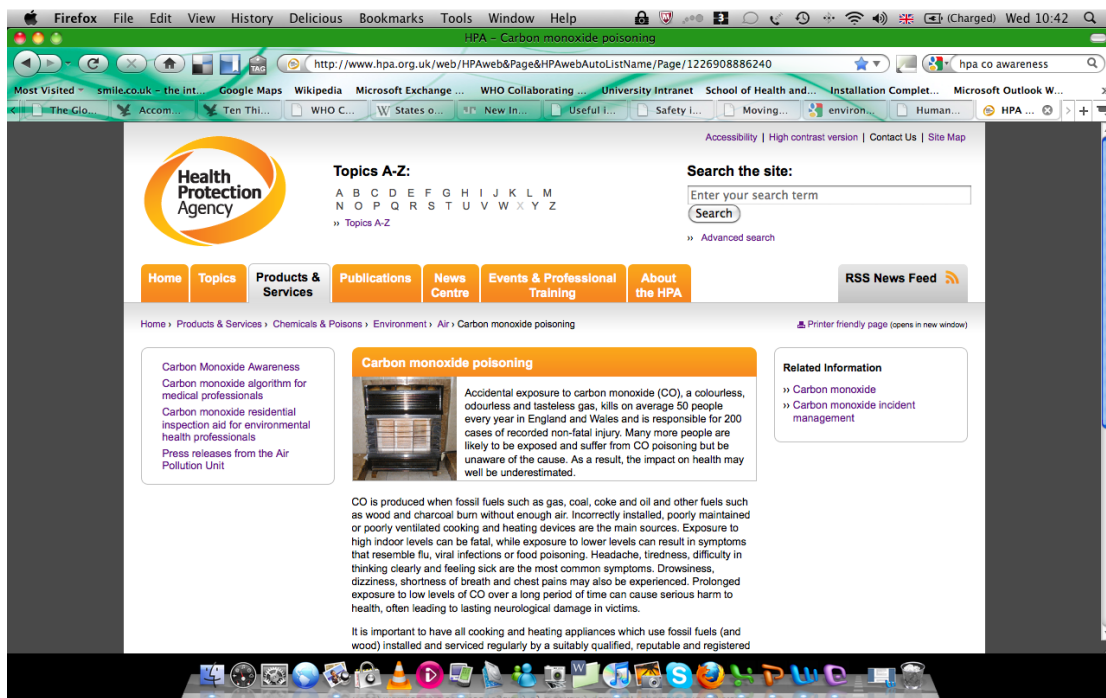
Gas leaks

Carbon monoxide (CO) poisoning can also be a problem in rented properties. Often called the "silent killer" – as it is odourless, colourless, and tasteless – CO can leak from faulty or poorly-maintained gas appliances. Even in low levels, the poison can leave lasting damage.

What to do if you suspect a gas leak

It is very important to have **no sparks or open flames** – this means no smoking, no matches, and no operating of electrical switches. **Turn off the gas at the meter**, and open all doors and windows. As soon as reasonably practicable, **call the National Safety Gas line on 0800 111 999**.

For more info, see the Shelter page on gas safety.



Will you wake up?



CARBON MONOXIDE CAN KILL!

Has your landlord got a gas safety certificate?

Find out more at HSE Gas Safety Advice Line: 0800 300 363 or on the web: www.hse.gov.uk/gas

ANNEX 2

SOME UK NATIONAL ORGANISATIONS AND BODIES WITH RESPONSIBILITIES/INTEREST IN CO AND GAS SAFETY

- *All Party Parliamentary Gas Safety Group*
The special interest group of Members of Parliament. APPGSG is a forum for discussion on gas safety issues. This takes account of those areas which affect both the gas installation industry and consumers, including the security of installation and supply of appliances; skills shortages and training; fuel poverty; irresponsible landlords; and the effects of social exclusion.
<http://www.gassafetygroup.org.uk/>
- *CO-Awareness*
Co-Awareness are an independent group based in Halton, Cheshire. They are working to raise awareness about the dangers of carbon monoxide (CO), prevent deaths and injuries from accidental CO poisoning, and support victims, families and friends.
<http://www.co-awareness.co.uk>
- *COCAA*
Carbon Monoxide Consumer Awareness Alliance consist of energy retailers, representatives of all fuel types, victim support charities, and other interested bodies and organisations. It aims to be the leading authority of CO poisoning awareness campaigning.
<http://www.becarbonmonoxideaware.com>
- *The Council of Gas Detection and Environmental Monitoring (COGDEM)*
CoGDEM represents over forty companies from around the world. It's membership accounts for over 80% of the UK domestic CO detection market and industrial gas detection, analysis and portable environmental monitoring market.
<http://www.cogdem.org.uk>
- *CO-Gas Safety*
The Carbon Monoxide and Gas Safety Society is an independent registered charity which works to try to prevent deaths and injuries from accidental carbon monoxide poisoning and provides help for families and friends of victims.
<http://www.co-gassafety.co.uk>
- *Committee on the Medical Effects of Air Pollutants (COMEAP)*
An advisory group of independent experts providing advice to government departments (particularly the Department of Health) on matters relating to the potential effects on health of air pollutants.
<http://www.advisorybodies.doh.gov.uk/comeap/index.htm>
- *Corgi*
The Council for Registered Gas Installers was (until April 2009) the national watchdog for gas safety in the UK. Now replaced by the Gas Safe Register (see below). Still provides technical information and documents for gas installers.
<http://www.trustcorgi.com/Pages/default.aspx>

- *Department for Communities and Local Government (DCLG)*
Formerly the Office of the Deputy Prime Minister (ODPM). The Department is responsible for housing, including housing conditions in existing and new housing. It is responsible for the Housing Health and Safety Rating System – the prescribed method for assessing housing conditions in England – which covers dangers from CO and fuel gas. It is also responsible for the Building Regulations which control the design and construction of new houses. The Department has no enforcement responsibilities – these rest with the local authorities.
<http://www.communities.gov.uk/hhsrs>
<http://www.communities.gov.uk/index.asp?id=1130474>
- *Department of Health (DoH)*
Department of Health produces various documents relating to Gas Safety. These include letters from the Chief Medical Officer to doctors and information from Committee on the Medical Effects of Air Pollution (see above).
<http://www.dh.gov.uk/en/index.htm>
- *Department of Trade and Industry (DTI)*
The department used to host gas safety information as a part of its Home Safety Network. But this service/responsibility has been dropped and gas safety information has been transferred to the Health and Safety Executive (see below).
- *Energywatch*
The gas and electricity consumer watchdog with responsibility for representing consumers. It publishes reports, including reports on social tariffs (arguing that these could reduce fuel poverty).
<http://www.energywatch.org.uk/>
- *The Environmental Toxins Foundation (ETF)*
ETF was set up in 2001 to cater for the lack of developmental and research programs in the field of toxicology. Their intention is to focus on the impact of chemical agents (including Carbon Monoxide) on human health.
<http://www.environmentaltoxinsfoundation.org.uk/>
- *Fire Service*
Provides information on carbon monoxide and fire safety generally.
<http://www.fireservice.co.uk/safety/carbonmonoxide.php>
- *The Gas Industry Safety Group (GISG)*
GISG was formed in 2000 by principal organisations in the industry to promote gas safety.
<http://www.gisg.org.uk/>
- *Gas Safe Register*
Replaced CORGI in Great Britain and the Isle of Man. Anyone carrying out work on gas installations and appliances must be on the Gas Safe Register.
<http://www.gassaferegister.co.uk/>
- *Health and Safety Executive (HSE)*
The body responsible for promoting and enforcing health and safety in the work environment. What is a ‘workplace’ is given a very wide interpretation, and includes anywhere where a person is working – so includes the home when a person is carrying out work there (eg, a gas engineer). Provides information on CO and gas safety for companies and individuals.
<http://www.hse.gov.uk/index.htm>

<http://www.hse.gov.uk/gas/index.htm>
<http://www.hse.gov.uk/gas/domestic/index.htm>

- *Health Protection Agency (HPA)*
The HPA is an independent body to protect the public from threats to health from infectious diseases and environmental hazards. It provides advice and information to the general public, local health services including general practitioners and hospitals, and local and central government.
<http://www.hpa.org.uk/>
- *LPG Association (Liquidified Petroleum Gas)*
The LPG Association represents the UK LP Gas Industry and promotes safe operations and standards throughout the Industry.
<http://www.lpga.co.uk/LPGA.htm>
- *National Association of Chimney Sweeps*
Membership organisation for those who specialise in cleaning chimneys (flues) serving solid fuel appliances.
<http://www.chimneyworks.co.uk/>
- *National Grid*
Formerly Transco, National Grid owns and operates the National Transmission System for gas throughout the UK.
<http://www.nationalgrid.com/uk/gas/>
- *Ofgem*
Office of Gas and Electricity Markets, Ofgem is the economic regulator for Britain's gas and electricity markets. It promotes competition and regulates monopolies.
<http://www.ofgem.gov.uk/Pages/OfgemHome.aspx>
- *Oil Firing Technical Association (OFTEC)*
Provides advice on using oil as a fuel for heating or cooking.
<http://www.oftec.co.uk/>
- *The Society of British Gas Industries (SBGI)*
A trade association, promoting and representing the gas industry.
<http://www.sbgi.org.uk/index.php?fuseaction=sbgi.home>
- *The Solid Fuel Association*
Established to promote and advise on domestic solid fuel heating.
<http://www.solidfuel.co.uk/frame/main.html>

ANNEX 3**STUDENT POPULATION AT WARWICK UNIVERSITY (2009)**

Total number of Students (full time equivalents)	16,734
Undergraduates	11,434 (68%)
Postgraduates	5,300 (32%)
Total number of International students	3,988 (24%)
International Undergraduates	1,862 (47%)
International Postgraduates	2,126 (53%)
Undergraduate admissions Oct 2008	3,809

Warwick Accommodation

Warwick Accommodation manages accommodation on campus and leases and manages houses off campus.

There are 5,779 bedrooms in campus accommodation across a range of undergraduate and postgraduate residences. Each of the residences is fully managed and has residential tutors and a warden who look after the welfare of the residents.

The Warwick Accommodation also manages a large portfolio of leased houses off-campus in Coventry, Leamington Spa, and Kenilworth. These houses provide another 1,600 bedrooms for Warwick students.

For the year 2009/10, there were 6,421 students registered with the University as living in private rented accommodation not managed by Warwick Accommodation.

ANNEX 4**PHASE 2 INTERVIEW QUESTIONNAIRE****Phase 2**

(April 2010)

Cover Page

Interview Date

DD	MM	2010
----	----	------

Interviewer Code (eg, I001; I002; etc)

I			
---	--	--	--

Student Details –

First Name

Surname (Family name)

University Number

Contact telephone No.

Email address

Student Code (eg, S001; S002; etc)*

S			
---	--	--	--

Address (while at the University)

Address Code (eg, A001; A002; etc)*

A			
---	--	--	--

Are you registered with a Doctors' Practice?

Yes	No
-----	----

If so, which Practice

* Student and Address Codes to be entered by supervisor. Each Subsequent Page to be headed by the Student Code and the Address Code. The codes and details to be securely stored and the first page destroyed. Where the student took part in Phase 1, the same Codes to be used.

Please tell the interviewee that this is not a test, and the answers should be honest and not a guess – “Don't Know” is a valid answer. It is normal not to know much about indoor air pollutants.

A Did you take part in the Survey in October 2009?

Yes	No
Don't Remember	

1. About You –

1.1 How old are you?

Under 20	20-25	26-30	Over 30
----------	-------	-------	---------

1.2 Male or Female?

Male	Female
------	--------

1.3 Do you smoke?

Yes	No
-----	----

If "No", go to 1.4; If "Yes" go to 1.3.1

1.3.1 If Yes to 1.3 – How many per day?

Under 5	5-10	11-20	Over 20
---------	------	-------	---------

1.4 Does someone else in your accommodation smoke inside the dwelling?

Yes	No
-----	----

1.5 Are you on any long term medication (not contraceptive pill)?

Yes	No
-----	----

1.6 Do you suffer with Asthma or have any allergies?

Yes	No
-----	----

1.7 What year of your current course are you in?

1 st	2 nd	3 rd	4 th	4 th +
-----------------	-----------------	-----------------	-----------------	-------------------

1.8 What are you studying?

--

1.9 What is your nationality

--

2. About your accommodation –

2.1 What sort of accommodation is it?

(tick one form of accommodation only) –

2.1.1 A room in a shared house (an unconverted house shared by a group) Yes

2.1.1.1 If yes, how many share the house?

2	3	4	5	6	6+
---	---	---	---	---	----

2.1.2 A bedsit in a converted house (a house converted to provide separate accommodation with some sharing, eg kitchen or bathroom) Yes

2.1.2.1 If yes, how many lettings are there?

2	3	4	5	6	6+
---	---	---	---	---	----

2.1.3 A room in a purpose-built block (sharing kitchen and/or bathroom) Yes

2.1.3.1 If yes, how many do you share with?

2	3	4	5	6	6+
---	---	---	---	---	----

2.1.4 A self-contained flat in a converted house (no shared facilities) Yes

2.1.4.1 If yes, how many lettings are there?

2	3	4	5	6	6+
---	---	---	---	---	----

2.1.5 A self-contained flat in a purpose-built block (no shared facilities) Yes

2.1.6 Other

2.2 What is the lowest floor of the building?

Base	Grd
------	-----

NB – In England the storey entered from the street is the Ground floor (0), not 1

2.3 What is the lowest floor of your accommodation?

Base	Grd	1 st	2 nd	3 rd +
------	-----	-----------------	-----------------	-------------------

3. About you and your accommodation –

3.1 How many years have you lived here?

<1	1	2	3	4
----	---	---	---	---

3.2 How many hours, on average, have you spent (awake and asleep) per day in your accommodation over the last week?

<8	8-12	>12
----	------	-----

3.3 What form of space heating do you have?
(tick all that apply)

NB – Space heating is the means to heat the rooms in your accommodation

Gas central heating	
Gas fires	
Electric	
Oil fired	
Solid fuel	
Don't know	

3.3.1 In Winter, is your accommodation warm enough?

Yes	No
-----	----

3.3.2 Do you use any supplementary heating?

Yes	No
-----	----

If "No", go to 3.4; If "Yes" go to 3.3.3

3.3.3 If yes, what sort? (tick all that apply)

Electric	
Flueless gas	
Flueless oil	
Other	Specify -
Don't know	

NB – In England, flueless oil heater is often referred to as a Paraffin heater
A flueless heater is one that is portable with no fixed flue/chimney to the outside.

3.4 What form of water heating do you have? (tick one only)

Gas flued	
Gas flueless	
Electric	
Don't know	

3.5 What form of cooking facilities do you have?
(tick all that apply)

Gas hob	
Gas oven	
Electric hob	
Electric oven	
Microwave	

3.5.1 On average, how often do you use your cooking facilities each week?

< 7 times	7 or more
-----------	-----------

3.6	Would any of these be a sign of a problem with a gas appliance?	Blue flame	
		Green flame	
		Orange flame	
		Don't know	

3.7	Are there any other signs that would suggest a problem with a gas, oil, or solid fuel appliance?	
-----	--	--

3.8.1	Who is responsible for maintaining the heating appliances? (tick one only)	Landlord/Agent	
		You	
		Don't know	

3.8.2	Who is responsible for maintaining the cooking appliances? (tick one only)	Landlord/Agent	
		You	
		Don't know	

3.8.3	If you had a problem with any heating and/or cooking appliance – who would you contact? (tick one only)	Landlord/Agent	
		A heating/gas engineer	
		Local Authority	
		Parents	
		Other	Specify -
	Don't know		

3.8.4	Is there a problem with your cooking or heating appliances?	Yes	No	Don't Know
-------	---	-----	----	------------

If "No" or "Don't Know", go to 3.8.6; If "Yes" go to 3.8.5

3.8.5	If 'Yes', specify why you think so	
-------	------------------------------------	--

3.8.6 If you suspected there was an immediate problem with the indoor air quality – what would you do?

(tick all that apply)

Call the Landlord/Agent	
Open the windows	
Turn off the cooking/heating appliances	
Call an emergency number	
Go outside until you are told it is safe to return	
Call your parents/a friend	
Call the local authority	
Other	Specify -
Don't know	

3.8.7 Do you know the telephone number for the landlord?

Yes	No
-----	----

NB – If the number is written down and in a place you know, tick ‘Yes’

3.8.8 Do you know the emergency telephone number?

Yes	No
-----	----

If “No”, go to 3.9; If “Yes” go to 3.8.9

3.8.9 If ‘Yes’, specify which is correct?

(tick all that apply)

999	
0800 111 999	
112	
911	

3.9 What means of ventilation do you have?

3.9.1 In the kitchen (if there is more than one kitchen, in the one you normally use) -

(tick all that apply)

Extract fan	
Windows	
Fixed vent (eg, air brick)	
Don't know	

3.9.2 In your living/bedrooms

(tick all that apply)

Windows	
Fixed vent (eg, air brick)	
Don't know	

3.9.3 In the bathroom (if there is more than one bathroom, in the one you normally use)-
(tick all that apply)

Extract fan	
Windows	
Fixed vent (eg, air brick)	
Don't know	

3.10 Is there a smoke detector fitted?

Yes	No	Don't Know
-----	----	------------

3.11 Is there a carbon monoxide detector fitted?

Yes	No	Don't Know
-----	----	------------

3.12 Is there a burglar alarm fitted?

Yes	No	Don't Know
-----	----	------------

3.13 Is a garage connected to your accommodation/ house?

Yes	No	Don't Know
-----	----	------------

3.14 On a clear day, do you sometimes have to use the lights to be able to read easily?

Yes	No
-----	----

3.15 Do you have any dampness or mould growth in your accommodation?

Yes	No
-----	----

If "No", go to 3.15.2; If "Yes" go to 3.15.1

3.15.1 If so, where?
(tick all that apply)

Bedroom	
Kitchen	
Bathroom	
Livingroom	

3.15.2 Do you think dampness can affect health?

Yes	No	Don't Know
-----	----	------------

If "No" or "Don't Know", go to 3.15.3; If "Yes" go to 3.15.2.1

3.15.2.1 If "Yes", using a scale of 1 to 5 (1 for mild and 5 for fatal) how serious can the health effects be?

--

3.15.2.2 If "Yes", what are the health effects?
(tick all that apply)

Breathing difficulties	
Chest pains	
Eye irritation	
Fatigue/tiredness	
Headaches	
Dizziness	
Ear ache	
Nausea/vomiting	
Rash	
Don't Know	

3.15.3 Do you think mould growth can affect health?

Yes	No	Don't Know
-----	----	------------

If "No" or "Don't Know", go to 3.16; If "Yes" go to 3.15.3.1

3.15.3.1 If "Yes", using a scale of 1 to 5 (1 for mild and 5 for fatal) how serious can the health effects be?

3.15.3.2 If "Yes", what are the health effects? (tick all that apply)	Breathing difficulties	
	Chest pains	
	Eye irritation	
	Fatigue/tiredness	
	Headaches	
	Dizziness	
	Ear ache	
	Nausea/vomiting	
	Rash	
	Don't know	

3.16 Can Oxides of Nitrogen be found in dwellings?

Yes	No	Don't Know
-----	----	------------

If "No" or "Don't Know", go to 3.17; If "Yes" go to 3.16.1

3.16.1 Does it have a smell?

Yes	No	Don't Know
-----	----	------------

3.16.2 Can you see it?

Yes	No	Don't Know
-----	----	------------

3.16.3 Can it affect your health?

Yes	No	Don't Know
-----	----	------------

If "No" or "Don't Know", go to 3.17; If "Yes" go to 3.16.3.1

3.16.3.1 If "Yes", using a scale of 1 to 5 (1 for mild and 5 for fatal) how serious can the health effects be?

3.16.3.2 If "Yes", what are the health effects? (tick all that apply)	Breathing difficulties	
	Chest pains	
	Eye irritation	
	Fatigue/tiredness	
	Headaches	
	Dizziness	
	Ear ache	
	Nausea/vomiting	
	Rash	
	Don't know	

3.16.3.3 What are the possible sources?

Pollution from outside (eg, traffic)	
Carpets and	

(tick all that apply)

furnishings	
Combustion (eg, cooking, heating appliances)	
Don't Know	

3.16.3.4 Where did you learn about it?

(tick all that apply)

Media (eg, TV, radio, newspapers)	
Internet	
Campaigns	
School/college	
Parents, relatives or friends	

Other	Specify -
-------	-----------

3.16.3.5 When did you learn about it?

(tick all that apply)

2009	2008	2007
Before 2007		

3.17 Can Carbon Monoxide be found in dwellings?

Yes	No	Don't Know
-----	----	------------

If "No" or "Don't Know", go to 3.18; If "Yes" go to 3.17.1

3.17.1 Does it have a smell?

Yes	No	Don't Know
-----	----	------------

3.17.2 Can you see it?

Yes	No	Don't Know
-----	----	------------

3.17.3 Can it affect your health?

Yes	No	Don't Know
-----	----	------------

If "No" or "Don't Know", go to 3.18; If "Yes" go to 3.17.3.1

3.17.3.1 If "Yes", using a scale of 1 to 5 (1 for mild and 5 for fatal) how serious can the health effects be?

--

3.17.3.2 If "Yes", what are the health effects?

(tick all that apply)

Breathing difficulties	
Chest pains	
Eye irritation	
Fatigue/tiredness	
Headaches	
Dizziness	
Ear ache	
Nausea/vomiting	
Rash	
Don't know	

3.17.3.3 What are the possible sources?

(tick all that apply)

Pollution from outside (eg, traffic)	
Carpets and furnishings	

Combustion (eg, cooking, heating appliances)	
Don't Know	

3.17.3.4 Where did you learn about it?

(tick all that apply)

Media (eg, TV, radio, newspapers)	
Internet	
Campaigns	
School/college	
Parents, relatives or friends	

Other	Specify -
-------	-----------

3.17.3.5 When did you learn about it?

(tick all that apply)

2009	2008	2007
Before 2007		

3.18 Can Formaldehyde be found in dwellings?

Yes	No	Don't Know
-----	----	------------

If "No" or "Don't Know", go to 3.19; If "Yes" go to 3.18.1

3.18.1 Does it have a smell?

Yes	No	Don't Know
-----	----	------------

3.18.2 Can you see it?

Yes	No	Don't Know
-----	----	------------

3.18.3 Can it affect your health?

Yes	No	Don't Know
-----	----	------------

If "No" or "Don't Know", go to 3.19; If "Yes" go to 3.18.3.1

3.18.3.1 If "Yes", using a scale of 1 to 5 (1 for mild and 5 for fatal) how serious can the health effects be?

--

3.18.3.2 If Yes, what are the health effects?

(tick all that apply)

Breathing difficulties	
Chest pains	
Eye irritation	
Fatigue/tiredness	
Headaches	
Dizziness	
Ear ache	
Nausea/vomiting	
Rash	
Don't know	

3.18.3.3 What are the possible sources?

(tick all that apply)

Pollution from outside (eg, traffic)	
Carpets and furnishings	
Combustion (eg, cooking, heating)	

appliances	
Don't Know	

3.18.3.4 Where did you learn about it?

(tick all that apply)

Media (eg, TV, radio, newspapers)	
Internet	
Campaigns	
School/college	
Parents, relatives or friends	

Other	Specify -
-------	-----------

3.18.3.5 When did you learn about it?

(tick all that apply)

2009	2008	2007
Before 2007		

3.19 Over the last month have you suffered from -

(tick all that apply)

Breathing difficulties	
Chest pains	
Eye irritation	
Fatigue/tiredness	
Headaches	
Dizziness	
Ear ache	
Nausea/vomiting	
Rash	
None of the above	

If "None of the above", go to 4; If "Yes" to any others go to 3.19.1.1

3.19.1.1	Do the symptoms ease or disappear when you are away from your flat/room?	Yes	No
3.19.1.2	Did you consult anyone?	Yes	No
3.19.1.3	If yes, who did you consult?	Doctor	Pharmacist
3.19.1.4	What was the diagnosis?		
3.19.1.5	Was any treatment prescribed?	Yes	No

4. There are regular campaigns about Carbon Monoxide –

4.1 Do you remember any CO awareness campaigns?

Yes	No
-----	----

If "No", then go to 5; If 'Yes', then go to 4.2

4.2 How many campaigns can you remember?

2010	2009	2008	2007
------	------	------	------

4.3.1 Which of the following do you remember
(tick all that apply)

Television	
Internet	
Social Networking Sites (eg, Facebook)	
Newspapers	
Leaflets	
Radio	

Other	Specify -
-------	-----------

4.3.2 Which one of these do you think is the most effective?
Specify -

--

4.4 What did you learn from the campaigns?

--

4.5 Did the campaigns make you change your behaviour?

Yes	No
-----	----

4.5.1 If Yes, in what way?

--	--

4.6 Do you think the campaigns could be more informative?

Yes	No
-----	----

4.6.1 If Yes, how?

--	--

5. Thank you for taking part in this survey.

This survey aims to assess what people know about indoor air quality, and, for it to be effective, it is important that you do not discuss what is covered with anyone who has not yet taken part.