



ORIGINAL RESEARCH

A pilot study to assess the possible methods of determining the burden of obstructive sleep apnoea syndrome in primary care

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KEYWORDS

Obstructive sleep apnoea;
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Summary

Introduction: A significant minority of otherwise healthy adults may suffer from disordered breathing during sleep. The commonest problem, known as Obstructive Sleep Apnoea Syndrome (OSAS), results in poor quality sleep, daytime hypersomnolence and excess risk of road traffic crashes. It is also associated with occupational injuries. OSAS can be successfully treated, reducing costs of hospitalisation. There is a gap in the literature regarding the burden of patients with OSAS in primary care, particularly because there is no agreed method for screening. *Objectives:* This pilot study was designed to determine the feasibility of screening for OSAS in a UK inner-city multi-ethnic primary care population, to investigate ways in which it might be detected, and to gain an awareness of the potential size of the burden of OSAS

Methods: We tested two methods of screening: firstly, postal questionnaires to a random sample of 240 patients from a subset of the population at highest risk of OSAS (men aged 35–65 years); and secondly, the same questionnaire plus two screening tools for detecting hypersomnolence, given to patients attending the practice for pre-registration health checks.

Results: Despite reminders, only 40% of postal questionnaires were returned and there were only 67 (28%) usable responses. The prevalence of snoring was 55%. Almost half of those patients who responded (46%) had a Body Mass Index (BMI) associated with a high risk of OSAS. This was not a positive responder bias because there were no significant differences in BMI between responders and non-responders. 12% had a collar size of greater than 17.5, whilst 34% reported daytime sleepiness, and 24% reported witnessed apnoea.

Screening during pre-registration health checks proved both feasible and productive with 38 patients of differing linguistic abilities completing the assessment.

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Conclusion: Screening for OSAS in primary care by means of a postal questionnaire produced a low response. Whilst there was no evidence of a responder bias in terms of BMI, the numbers reporting large collar size, daytime sleepiness and witnessed apnoea suggest that a sizeable proportion of the population is at risk of OSAS. Questionnaires used in this study provide a means of identifying patients with symptoms suggestive of OSAS, although the sensitivity, specificity and positive predictive value of a self-administered instrument needs to be confirmed by a larger study incorporating ventilatory monitoring during sleep. The addition of screening to pre-registration health checks is feasible, but it would take a long time to screen all those at risk for OSAS by this route.

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Introduction

A narrow collapsible upper airway provides the pathophysiological basis for obstructive sleep apnoea syndrome (OSAS). When the individual is awake this usually causes no problems. During sleep the loss of skeletal muscle tone makes the upper airway narrower and floppier, particularly during rapid eye movement (REM) sleep when muscle relaxation is especially profound [1]. Partial narrowing on inspiration results in turbulent airflow patterns and snoring, whereas occlusion results in apnoea. Until sleep is interrupted and muscle tone is returned, apnoea leads to hypoxia and progressively more strenuous respiratory efforts. The consequent arousals are often brief; sleep will recommence after a few breaths, the airway muscles will relax and the cycle will begin again. Continual disturbance of sleep causes severe sleepiness during daytime. Certain types of body habitus of congenital or acquired origin, including obesity, predispose to the condition [2,3].

OSAS is associated with conditions that account for leading causes of mortality in adults: hypertension, cardiovascular and cerebrovascular disease [4–6]. In addition, daytime sleepiness and impaired cognitive function, symptoms that are linked with OSAS, are of potentially great public health and economic importance, not least through their contribution to motor vehicle crashes and occupational injuries [7].

Current research indicates that making the diagnosis of OSAS in general practice would be worthwhile and cost-effective. Features of OSAS have often been present for some time before patients are referred to sleep services. In a series of 155 patients being treated for OSAS, 84% reported that excessive daytime sleepiness had been present for a median of eight years prior to diagnosis, and in 80% a bed partner had witnessed apnoea for a similar time before diagnosis [8]. Canadian studies

reveal that in the two years preceding diagnosis, patients with OSAS have a higher than average use of health services and a significantly increased need for treatment of heart and vascular disorders [9,10]. Nasal continuous positive airway pressure (CPAP) is an effective treatment for OSAS, and is associated with reduced blood pressure especially in patients taking blood pressure medication [11], increased quality of life [12] (reduced daytime sleepiness and improved alertness [13]), and a reduction in the rate of road traffic crashes [14]. Furthermore, avoided road traffic crashes alone would make treatment of OSAS decidedly cost effective since there would be a 12.3-fold return on investment [15]. Hospitalisation costs could also be decreased [16].

Currently, there is a gap in the literature regarding the burden of OSAS in primary care because there is no agreed and effective screening tool. The Berlin questionnaire has recently been used in the USA, Germany and Spain [17] but not in the UK. The participants were individuals attending primary care facilities during a defined period and there was no validation of results.

The present study was designed to investigate ways in which the burden of OSAS in a multi-cultural inner city general practice might be detected, and to determine the feasibility of screening for OSAS in primary care.

Methods

The study was undertaken at a fully-computerised inner city general practice in Hammersmith, West London.

For this pilot study it was decided to use a postal questionnaire in preference to alternatives such as face-to-face or telephone interviews. This was because self-completed questionnaires could be distributed in large quantities at the same time, for relatively little cost.

This part of London is multicultural, with over 40 different racial groups and no predominant non-English language, but translation of the questionnaire into numerous languages was not undertaken due to cost constraints. The area's largest ethnic group is White (77.8%) and the largest minority groups are Black Caribbeans (5.2%) and Black Africans (4.9%). A third (33.6%) of the resident population was born outside the UK [18].

The pilot screening tool, a self-completed questionnaire, was an adapted compilation of the instrument used by Enright et al., [19] the Berlin Questionnaire [20] and The Sleep Heart Health Study Questionnaire [21] (see Appendix 1). The items sought a history of any features of OSAS such as snoring, excessive sleepiness, and witnessed apnoeas during sleep, as well as details of the participant's driving status and co-morbidity such as high blood pressure. A copy of the Epworth Sleepiness Score [22] was incorporated to quantify sleepiness. This scale asks the participant to rate their chance of falling asleep in eight common situations. The range of possible scores is 0–24, with scores above 12 regarded as indicating excessive sleepiness.

The highest risk group for OSAS (males aged 35–65 years) was chosen as the postal questionnaire study population [23–25]. Patients who had known OSAS, and those considered unable to co-operate or to give informed consent due to severe psychiatric illness or profound learning difficulties, were excluded. The initial survey involved a random sample of 120 patients (5% of males in the target age range), selected using the practice's computerised database. These patients were sent the self-completed questionnaire together with a covering letter signed by their general practitioner (GP), an information sheet, consent form, and a reply-paid envelope. A postal reminder letter and questionnaire were sent to non-respondents two weeks after the first mailing.

A low response to this first mailing and a high percentage of mail returned as undeliverable, led to a review of relevant records in the practice. This revealed low consultation rates and incomplete records for a proportion of the non-respondents and led to a second random sample of 120 patients being selected. This batch was chosen with the extra inclusion criterion that patients had to have attended a consultation at least once in the last seven years, hopefully eliminating 'ghost patients' and those who had not notified the practice about a change in residence. This second sample of patients was sent the same initial postal package and, two weeks after mailing, non-respondents again were sent a reminder.

Upon return, quantitative data from respondents' answers were coded and entered into a computer database. Each participant's Epworth Score was derived, and body mass index (BMI) was calculated for each participant from his self reported height and weight. Descriptive analyses of response, demographic details, co-morbidity, symptoms of OSAS, driving history and sleepiness scores, were then undertaken using the SPSS software, version 11.5. Data on respondents' BMI were compared with those contained in the practice records of non-responders.

For the second part of the study, the feasibility of adding screening tools and research questions to pre-registration health checks was assessed. Staff members were asked to inform patients about the research study and to inquire if they would be happy to participate. They were then to offer the patients a new pictorial Epworth Sleepiness Scale (The Charing Cross Pictorial Epworth) using structured instructions and, at the end of the consultation, to offer the written questionnaire used in the postal research which included the traditional written Epworth Scale. Prior studies of patients attending hospital services had shown good correlation between two versions of the Epworth scale, but further validation in a multicultural primary care setting was needed. The questionnaire was to be completed in reception and handed back to staff before leaving the surgery. The person conducting the pre-registration health check was also asked to evaluate how patients reacted to the research, and was asked to give their own views on how the research had been integrated into the everyday routine of the practice.

Quantitative data from the in-practice questionnaire were analysed using the same methods as employed for the postal tool.

The Riverside Research Ethics Committee approved the protocol for the study.

Results

Results of the postal survey

Comparison of response to the first ($n=120$) and second ($n=120$) sets of postal questionnaires showed no statistically significant differences in demographic characteristics nor frequency of consultation in 2003, despite the minor amendment in the sampling technique. In addition, the proportions of valid responses (22% vs. 34%), letters returned as undeliverable (13% vs. 6%) and non-response (62% vs. 58%) were broadly similar.

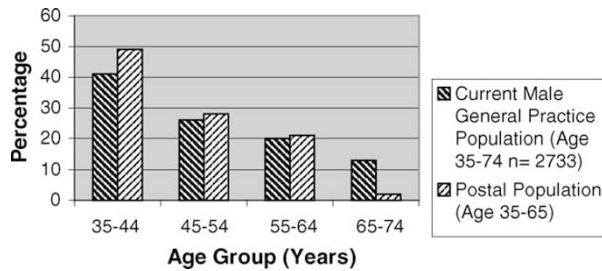


Figure 1 Comparison of age groups within the general practice and postal survey populations.

Therefore, these results are presented as a single sample of 240 adult males aged 35–65 years.

Where possible, demographic data were collected from the general practice computerised database. The arithmetic mean (\pm standard deviation (SD)) age was 46.8 (\pm 8.6 years), with a mode of 39 years. This random study sample was considered representative of the practice population of male patients in relation to age (see Fig. 1). Additionally, this pattern accords with local census information [26].

Information regarding ethnicity of the 240 patients was incomplete, with 39% ($n=94$) not having this information recorded in their medical record. Of the 146 recorded ethnic origins, the highest proportion were White (51% $n=122$) followed by Black or Black British (4.6% $n=11$), Asian (2.9% $n=7$), and other or mixed ethnic origins (2.6% $n=6$). As ethnicity data were incomplete for the whole practice population, it was not possible to make comparisons with the study sample.

Practice records of BMI for responders and non-responders showed a mean BMI for responders of 26.5 (SD 5.9) in the 66 patients for whom data were recorded, and a mean BMI of 26.0 (SD 4.3) in 108 non-responders for whom data were available. The mean BMI derived from the completed questionnaires was 25.7 (SD 4.2). As this comparison indicates that there was no significant responder bias, the rest of the interpretation and discussion is based upon self-reported BMI.

Analysis of completed postal questionnaires

Overall there was a response rate of 28% ($n=67$), plus a further 23 questionnaires (10%) which were returned as undeliverable, and five (2%) which were returned with participation consent refused. The age range of the patients returning usable questionnaires was 35–64 years with a mean (SD) of 49.2 (8.0) years and a mode age of 47. The ethnic origins of these patients were principally White ($n=56$), and the remaining patients were of Asian ($n=6$), Black ($n=2$) and Mixed ($n=1$) ethnic origins. Two patients failed to report their ethnic origins.

Body mass index (BMI) could be calculated for 64 patients and ranged from 19–38 kg/m² with a mean BMI (SD) of 25.7 (4.2) kg/m². Using Bray's criteria [27], one patient was underweight, 32 were in the acceptable weight range for height, 24 would be considered overweight, and seven patients were obese.

Of the patients who completed the questionnaire, 58 (87%) reported their collar size. Reported collar sizes ranged from 14–20 inches, with seven (12%) having a collar size of 17.5 or more.

Sixty-five participants answered the questions on their driving status and history. Analysis revealed 35 participants held a single ordinary licence, and three participants held two licences. Eight participants reported that they had had at least one road crash in the last 5 years. One of these, a patient aged 62 years, reported that he drove almost every day of the week and that he held two licences (motorbike and ordinary). He had positive responses for snoring, cessation of breathing during sleep and daytime sleepiness, a collar size of 16 and an Epworth Score of 9. Three of the other patients who had had crashes held ordinary licences, drove almost every day of the week, and reported snoring and Epworth scores ranging from 6–10. The remaining four patients did not report any symptoms of OSAS, but one had an Epworth Score of 15.

With regard to other symptoms associated with possible sleep apnoea (Fig. 2):

- Complaints about loud snoring were reported by 37 participants (55%), with a median time since the first recalled report of snoring of 10 years, a range of 1–32 years (2003–1972) and an interquartile range (IQR) of 5–14 years.
- 16 patients (24%) reported that someone had told them that, whilst asleep, there were times when they stopped breathing for a while, then snored and snorted loudly. The median time since the first recalled report of breathing cessation was 5 years (range: 0–31 years; IQR: 2–12 years).
- Daytime sleepiness was recorded by 23 participants (34%). The range of time since these periods of sleepiness started was 1–39 years (median: 8 years; IQR: 4–10 years).

Scores for the Epworth Scale were available for 64 of the 67 participants, and ranged from 0 to 24. The median score was 4 out of 24 (IQR: 2–8). The highest Epworth Scores were 24, 20, and 15; participants gaining scores of 24 and 20 are described below. The participant with a score of 15 reported no symptoms of OSAS but did report a crash while driving in the last 5 years.

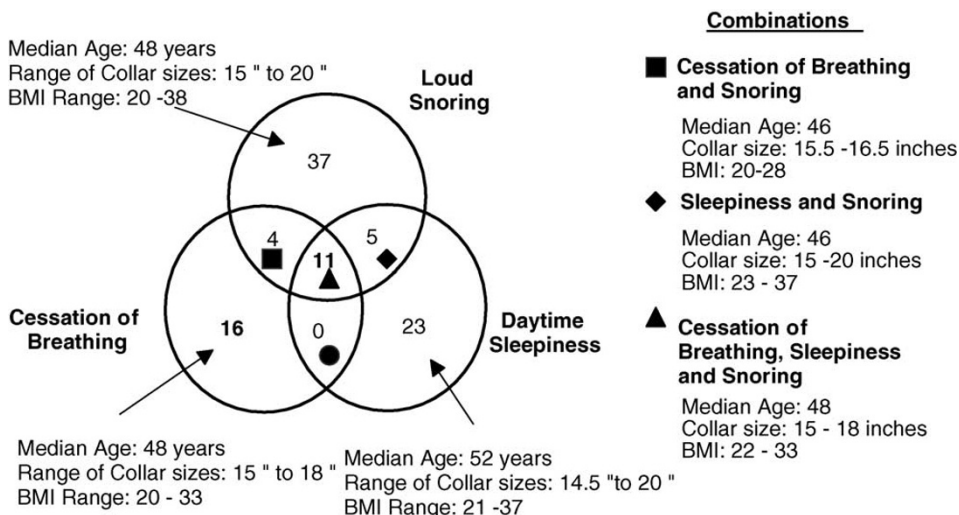


Figure 2 Features of possible sleep apnoea reported by postal survey participants.

There was only one patient with a combination of snoring, cessation of breathing during sleep, daytime sleepiness and a high Epworth score. This patient was aged 35 years, had no knowledge of his collar size, had a 'normal' BMI of 22 kg/m² and an Epworth score of 20.

Another patient aged 55, with a very high Epworth score of 24, reported symptoms of snoring and daytime sleepiness. He had a BMI of 37 kg/m² which is in the obese range, a collar size of 17.5 inches, and had nocturia three times a night.

Pre-registration health checks

During the study period, 45 new patients (23 male, 22 female) completed pre-registration health checks at the practice. They were aged between 18 and 54 years, with a mean age (SD) of 28 (6.9) years (see Fig. 3), and 34 (76%) of them were white.

Of the patients who completed a health check, 38 answered both the Charing Cross Pictorial Epworth Scale and the written screening tool. Four patients completed only the Pictorial Epworth scale; two of these had 'no time' and one had

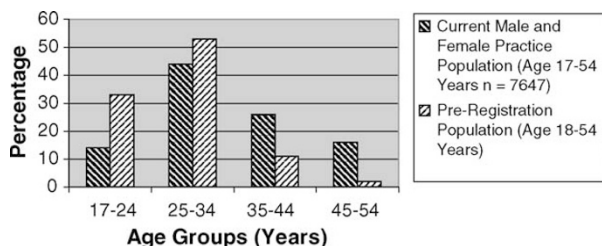


Figure 3 Comparison of age groups within the general practice and pre-registration populations.

no comprehension of English. The final patient's slight understanding of English meant that after partial translation she was able to complete the Pictorial Scale but found the majority of the written document too difficult to comprehend. Two patients were too unwell to complete both screening tools and one patient refused to participate in the study.

Screening tool results in those attending for pre-registration health checks

The mean (SD) BMI of these 45 patients was 23.7 (3.7) kg/m². Again, using the standard interpretations of BMI [27], one male patient and five female patients were underweight, 12 male patients and 10 female patients were in the normal weight range, five male and five female patients were overweight, and one patient was obese.

Of the 19 male patients who answered the self-completed screening tool, only 10 had knowledge of their collar size (range 15–17.5 inches). Features suggestive of possible OSAS, such as witnessed apnoea, snoring, sleepiness and high BMI, found in those attending pre registration health checks, are shown in Fig. 4.

Scores for the Traditional Epworth Scale ranged from 1–17 with a median score of 6.5 out of 24 and the Charing Cross Pictorial Epworth scores ranged from 0–14. Significant hypersomnolence is usually regarded as an Epworth score of 10 or more. The highest Epworth scores recorded were by a female who scored 17 and 14 in the Traditional and Pictorial scales, respectively. This patient also reported daytime sleepiness in the self-completed screening tool but no other symptoms.

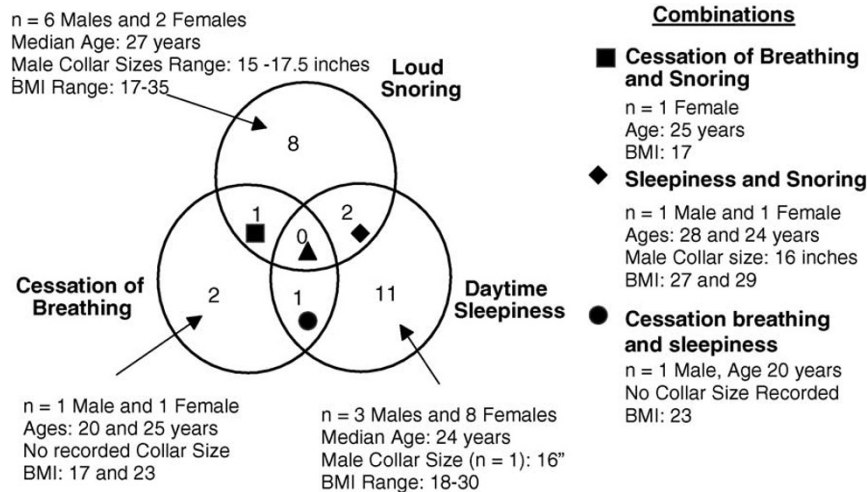


Figure 4 Features of possible sleep apnoea reported in pre-registration health checks.

Discussion

Services for the diagnosis and management of OSAS are frequently under-resourced, and their availability is patchy. However, evidence exists of delays in diagnosis, and resultant suffering and excessive use of other resources [8–10]. Earlier referral for diagnosis of those most at risk of OSAS would seem to be sensible. Whether this should involve formal screening of the population, public awareness campaigns, or improved health professional understanding of the condition, is unclear.

In this study, postal questionnaire screening to determine the likely burden of OSAS in a multi-cultural inner city general practice resulted in only 28% usable responses. Only one questionnaire from the postal survey was answered inadequately because of limited comprehension of English, but we cannot judge whether similar problems contributed to the low overall response. Lack of facility in English was a reason for non-completion in two patients undergoing pre-registration health checks. In larger studies, this could potentially be overcome through translation, provided the general practice had a record of each patient's preferred language.

Whilst the participants in the postal survey were demographically representative, the low response may have introduced a positive responder bias, leading to over-estimation of features suggestive of OSAS. Though our data on BMI militate against positive responder-bias amongst those morphologically at risk of OSAS, there could still be responder bias amongst those who snore. This could be a reason for our relatively high

snoring prevalence of 55%, this being higher than the usually quoted prevalence of 40%. Previous studies in primary care have shown response rates of 50–60% [28,29,30]. One postal survey of satisfaction with the NHS amongst patients randomly selected from general practices in the borough of Hammersmith and Fulham recorded a response rate of 29% [31]. The Cochrane Database of Methodology [32] has reported that the most effective approaches for increasing response to postal questionnaires are recorded delivery and monetary incentives. Both telephone and postal reminders also increase response [29,33]. Undeliverable mail contributed to our low response. Patients who change address without notifying their doctor are an acknowledged problem within primary care, and potentially limit screening programmes run from general practice.

Out of those who responded, 46% had a BMI that might suggest higher risk of OSAS, 12% had a collar size greater than 17.5, and 24% reported witnessed apnoea. The prevalence of snoring was much higher at 55%. One third of respondents (34%) reported what might be interpreted as excessive sleepiness. A number of individuals had combinations of these symptoms: for example, 11 respondents (16%) reported witnessed cessation of breathing, sleepiness and snoring; and nine reported snoring, either with witnessed apnoea or sleepiness. The results suggest that a sizeable proportion of the population might be at risk of OSAS.

As an alternative to a postal survey, detection of excessive daytime sleepiness (a key feature of OSAS) via pre-registration health checks, using two

different sleepiness-screening tools and the written questionnaire, proved feasible and productive. 38 patients completed both sleepiness scales, with the majority (71%) having no problems understanding them. 21% of patients who completed the written screening tool had been told that they snore loudly, while 5% reported witnessed apnoea. Daytime sleepiness was reported by 29% of patients, although the Epworth scale indicated that only one of these patients had what might be regarded as excessive sleepiness. However, the age profile of those attending for pre-registration health checks was skewed toward younger age groups, where the risk of OSAS is low. Discussions with general practice staff and evaluation of appraisal sheets revealed that implementation of screening via pre-registration health checks was well accepted, with noteworthy surprise as to how little disruption the 'research' caused to daily routines. Staff who participated in the recruitment of new patients and collection of data during health checks found the project both interesting and educational, and the reactions of patients were similarly encouraging.

Despite the addition of OSAS screening questions to pre-registration health checks proving feasible and acceptable to patients, those undergoing such checks are often younger than those patients most at risk of OSAS. Administration of the questionnaires used in this survey (when validated) to all males between the ages of 25–65 attending at the surgery for any reason is a possible alternative strategy — but males of this age group consult less

frequently than any other group, and opportunistic administration of a questionnaire is likely to miss a large proportion of the population at risk.

The screening questionnaire used in this study now needs to be further refined and validated, by undertaking sleep studies in patients with and without features suggestive of OSAS, in order to determine its sensitivity and specificity. A recent US study suggests that sleep studies using overnight oximetry alone may be sufficient in this context [34]. However, research into the condition is under-supported [35], and validation of a screening questionnaire would place further pressures on limited diagnostic services. Nevertheless, once validated, such tools may permit a focused attempt to screen for the condition amongst those more likely to have it (for example the obese or hypertensive), or amongst those at greater risk of consequences from non-treatment (for example, commercial drivers). In parallel with attempts to improve instruments and protocols for screening, there is a need for greater public and health professional awareness of OSAS, if the condition is to be recognised and treated more promptly.

Acknowledgment

This work could not have been carried out without the kind cooperation of Miss Ramesh Ghiassi, Clinical Scientist, Sleep Laboratory, Charing Cross Hospital.

Appendix 1

APPENDIX

Sleep Apnoea Questionnaire One – 2004

Emis N^o

Date: / /

		The boxes below are for staff use only. Please do not write in them.
Q.1	Please complete the following: (please write your answers)	
	1. HeightFeet and inches/ metres	<input type="text"/> <input type="text"/>
	2. Sex Male/Female	<input type="checkbox"/>
	3. WeightStones and pounds/ Kg	<input type="text"/> <input type="text"/>
	4. Age Years	<input type="text"/> <input type="text"/>
	5. Ethnicity(If you are unsure please choose from the list at the end of the second questionnaire.)	
Q.2	Do you know your shirt collar size? (Please circle your answer)	
	1. Yes -Please answer the question below before Question 3	<input type="checkbox"/>
	2. No - Please go to Question 3	<input type="checkbox"/>
	If you answered yes, please state your collar size	<input type="text"/> <input type="text"/>
Q.3	Has anyone ever complained that you snore loudly? (Please circle your answer)	
	1. Yes - Please go to Question 4	<input type="checkbox"/>
	2. No - Please go to Question 5	<input type="checkbox"/>
Q.4	When did someone first complain about your loud snoring? (Please write your answer)	
	In (number of year e.g. 1995)	
	OR years ago (e.g. 8 years ago)	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Q.5	Has anyone ever told you that, while you are sleeping, there are times when you stopped breathing for a while, then snored and snorted loudly? (Please circle your answer)	
	1. Yes - Please go to Question 6	<input type="checkbox"/>
	2. No - Please go to Question 7	<input type="checkbox"/>
Q.6	When did someone first tell you that you stopped breathing in your sleep? (Please write your answer)	
	In (number of year e.g. 1995)	
	OR..... years ago (e.g. 8 years ago)	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Q.7	Are you usually sleepy in the daytime? (Please circle your answer)	
	1. Yes - Please go to Question 8	<input type="checkbox"/>
	2. No - Please go to Question 9	<input type="checkbox"/>

Please turn over and complete the remaining questions...

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<p>Q.8 When did this problem of daytime sleepiness start? (Please <u>write</u> your answer) In (number of year e.g. 1995) OR years ago (e.g. 8 years ago)</p>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<p>Q.9 Have you ever been told that you have high blood pressure by a Doctor or nurse (Please <u>circle</u> your answer) 1. Yes 2. No 3. Do not know</p>	<input type="checkbox"/>
<p>Q.10 Which of the following kinds of driver's licence do you have? (Please circle all the answers that apply to you.) 1. Ordinary driver's licence - Please go to Question 11 2. LGV - Please go to Question 11 3. PCV - Please go to Question 11 4. Motor bike - Please go to Question 11 5. I do not have a drivers licence – Please go to Question 13</p>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<p>Q.11 How often do you drive a motor vehicle now? (Please <u>circle</u> your answer) 1. On most days of the week - Please go to Question 12 2. At least once each week - Please go to Question 12 3. Less often than once each week - Please go to Question 12 4. Never - Please go to question 13</p>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<p>Q.12 How many crashes (however minor) have you had in the last 5 years while driving? (Please <u>write</u> your answer) Crashes in the last five years ñ Please go to question 13</p>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<p>Q.13 How often do you wake to pass water (urinate) during your sleeping hours? (Please circle the answer that best applies to you.) 1. Never 2. Once 3. Twice 4. Three times 5. Four times 6. More than four times</p>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

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THANK YOU FOR YOUR HELP
 You have finished the **first** questionnaire, **now please complete the second questionnaire**

Emis N^o □□□□□**Questionnaire Two.**

In contrast to just feeling tired, how likely are you to doze off or fall asleep in the following situations? Even if you have not done some of these things recently, try to work out how they would affect you. Use the following scale to choose the most appropriate number for each situation.

0 = no chance of dozing**1 = slight chance****2 = moderate chance****3 = definitely would doze**

Situation	Chance of Dozing
Sitting and reading	-----
Watching TV (television)	-----
Sitting inactive in a public place (e.g. Theatre or a meeting)	-----
As a passenger in a car for an hour without a break	-----
Lying down to rest in the afternoon when circumstances permit	-----
Sitting and talking to someone	-----
Sitting quietly after lunch without alcohol	-----
In a car, while stopped for a few minutes in the traffic	-----

THANK YOU FOR YOUR HELP

You have now finished both questionnaires . Please return both questionnaires to reception or to the person who conducted your pre-registration health check.

<u>Ethnicity Help List:</u>		
<u>White</u>	<u>Black or Black British</u>	<u>Asian or Asian British</u>
White British	Black Caribbean	Indian
White Irish	Black African	Pakistani
White Other	Black Other	Bangladeshi
		Other Asian
<u>Mixed</u>	<u>Other Ethnic Groups</u>	
White and Black Caribbean	Chinese	
White and Black African	Other Ethnic group	
White and Asian		
Mixed		
Other		

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