Survey of Noise Attitudes 2014: Aircraft Noise and Sleep Disturbance

CAP 2161

Contents

Chapter 1
Introduction

1.1   This report describes results within a research study to obtain new and updated evidence on attitudes to aviation noise around airports in England (SoNA 2014)[1]. The study was commissioned by the Department for Transport, and this report focuses on self-reported attitudes to sleep disturbance from aircraft noise, taken from responses to questions from within the larger SoNA 2014 study.

1.2   The main focus of the SoNA 2014 study was on annoyance responses and general attitudes to aircraft noise. However, there was also a subset of questions relating to self-reported sleep disturbance and night noise from aircraft. It is the responses to these questions that are described within this report. It should be noted that the SoNA 2014 study was not designed specifically with a view to analysing attitudes to aircraft noise at night, and therefore this is very much an exploratory examination, with the consequential limitations. In the context of aircraft noise, the night period refers to the time between 11pm and 7am.

1.3   The overall aims of the SoNA 2014 Sleep Disturbance analysis are to:

- Explore relationships between self-reported sleep disturbance and noise exposure.

- Explore any potential relationship between self-reported sleep disturbance and self-reported quality of health.

1.4   The report is structured as follows:

- Background

- Methodology

- Social survey results

- Noise exposure and self-reported sleep disturbance

- Health and wellbeing

- Conclusions

The Glossary to the report gives definitions of the more commonly used technical terms concerning aircraft and airport operations used here.

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[1]   Survey of Noise Attitudes 2014: Aircraft Noise and Annoyance, Second Edition. CAP 1506. Civil Aviation Authority, July 2021.

Chapter 2
Background

2.1   Sleep is ubiquitous across species, and is fundamental to health and wellbeing, providing a regular resting period and preventing fatigue. Functions of sleep range from restoration at the cellular level, to neuronal repair, and it even plays a role in memory consolidation. Sleep researchers have been aware for quite some time that noise can disturb the sleep cycle. Next-day effects also exist, including increased fatigue, decreased performance levels and a resulting negative effect on mood. Noise also acts as a stressor on the body which can have long-term health effects on the cardiovascular system.

2.2   The most accurate method of measuring sleep is by using an Electroencephalogram (EEG) to measure changes in electrical activity in the brain as the subject sleeps. Whilst providing the most accurate and detailed method of sleep measurement, it is a relatively expensive and time-consuming method of sleep monitoring and is best conducted in a laboratory setting. As well EEG, researchers also use actigraphy, which uses a device worn on a limb to measure and log movements. It is much less expensive and invasive than EEG, but only detects movement rather than changes in brain activity associated with different sleep stages.

2.3   Surveys, using 'self-reported' measures of annoyance or sleep disturbance are useful for obtaining larger data sets, but they may overestimate the adverse effects of night-time aircraft noise, and may create bias. Previous UK research on aircraft noise and sleep disturbance have relied upon objective measures of sleep using actigraphy and EEG.

2.4   In 1992 the findings of a field study into aircraft noise and sleep disturbance, commissioned by the Department for Transport was published (Ollerhead et al, 1992[2]). This study combined social survey methods with actigraphy and EEG recordings on a sub-group of participants which enabled validation of the actigraphy with respect to aircraft noise-induced sleep disturbance.

2.5   The objectives of that study were to determine:

a)   The relationships between outdoor aircraft noise levels and the probability of sleep disturbance.

b)   The variation of these relationships with time of night.

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[2]   Report of a Field Study of Aircraft Noise and Sleep Disturbance, J B. Ollerhead et al. Department for Transport, December 1992.

2.6   Non-acoustical factors were also examined, such as age, sex, personal
           characteristics, and views of the neighbourhood, perceptions of sleep quality and
           the ways in which this might be affected by aircraft noise.

2.7   The 1992 study used eight sites; two each around Heathrow, Gatwick, Stansted
           and Manchester Airports, and were selected for a range of noise exposure
           levels, including differing combinations of event levels and numbers of events.
           200 subjects completed social surveys, with 50 of the subjects also completing
           15 nights of actigraphy, sleep logs and daytime sleepiness questionnaires. From
           these 50 subjects, six had their EEG recorded simultaneously with the actigraphy
           for four consecutive nights at each site.

2.8   The study concluded that less than one quarter of all subjects reported having
           their sleep disturbed by aircraft noise, this occurring on average once every five
           nights.

2.9   The results suggested that below outdoor event levels of 90 dB SEL (about
           80 dB L_{ASmax}), Aircraft Noise Events (ANEs) are most unlikely to cause any
           increase in measured sleep disturbance from that which occurs naturally during
           normal sleep. For those ANEs above this level, the average arousal rate was
           about 1 in 30 aircraft noise events.

2.10   The study suggested that people might show increased sensitivity to noise at
           certain times of the night. The authors concluded that sensitivity to aircraft noise
           is low during the first part of sleep, and increases until 03:00-04:00, and then
           decreases to a low level at the end of the night again. In general, males were
           found to be 15% more susceptible to disturbance (with or without aircraft noise).

2.11   Horne et al, (1994)[3] undertook further analysis of the 1992 study. It reported
           small age and gender effects, which became apparent at about 180 minutes into
           sleep and increased towards the end of sleep, with males exhibiting more sleep
           disturbance than women, in general and as a result of aircraft noise. In terms of
           age for both genders, younger people (20–34 years) moved around more during
           sleep, which may interfere with actimetry.

2.12   The findings from this 1992 field study indicated that the extent to which people
           experience sleep disturbance due to aircraft noise is much less pronounced in
           field studies where they are sleeping in their own home, compared to laboratory
           studies where subjects are sleeping in unfamiliar surroundings and beds. The
           sleep of most subjects was largely unaffected by ANEs. The louder the ANE, the
           greater the likelihood of an effect on sleep, but the response to louder ANEs (e.g.
           L_{ASmax} >80 dB, outdoors) was still very low on average. In this study, the most

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[3] Horne, J., Pankhurst, F., Reyner, L., Hume, K., and Diamond, I. (1994). "A field study of sleep disturbance:
    Effects of aircraft noise and other factors on 5,742 nights of actimetrically monitored sleep in a large
    subject sample," Sleep 17, 146–159.

disturbing factors were reported to be disturbance from young children and bed partners, illness, and needing to go to the toilet; aircraft noise ranked relatively low as a cause of sleep disruption.

2.13   In 2000, Porter et al[4] published a report on the adverse effects of night-time aircraft noise. One of the findings suggested that noise heard at night was more intrusive and noticeable than noise heard during the day. This was thought to be due to reduced outside and inside background noise at night, and the circadian phase. It may also be a time of increased sensitivity to noise. Porter et al also noted that historic research in the UK, e.g. UK 1992 Sleep Study, relied on physical measurement of sleep disturbance, as there is a tendency to assume that physical measurement is more reliable than a subjective rating. However, "it is important to recognise that perception of harm may be as important to health and wellbeing as physical disturbance".

2.14   Basner and Samel (2006)[5] at the DLR Institute for Aerospace in Germany conducted a large-scale, field study that aimed to investigate the acute effects of nocturnal aircraft noise on human sleep. The study highlighted that there have been conflicting findings in terms of assigning a threshold over which sleep disturbance is more likely to occur. The study used polysomnography to identify aircraft noise-induced sleep stage changes. The final analysis was based on 64 subjects and 483 subject nights that were exposed to 10,658 noise events. The study found that the probability of an awakening[6] increased with increasing indoor maximum noise level, $L_{ASmax,indoor}$ and could be approximated to a second-order polynomial with first reactions occurring at an $L_{ASmax,indoor}$ of 32.7 dB. The authors suggested that the large difference between the awakening threshold in this study and the 1992 UK field study is due to the insensitivity of the actimetry used in the 1992 UK field study.

2.15   The authors went on to show how the probability of a sleep stage change can be applied to an airport situation to estimate the overall probability of experiencing at least one or more noise induced awakening by applying the probability function to the distribution of individual aircraft noise events in the vicinity of an airport. The analysis showed that sleep stage change risk may be lower than estimated from average L_{night} noise dose where events are noisy but relatively few, but higher, where events are relatively quiet, but more numerous.

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4   Porter, N.D.; Kershaw, A.D.; Ollerhead, J. (2000) Adverse effects of night-time noise. R&D Report 9964. DORA on behalf of the Department of the Environment, Transport and the Regions.

5   Basner, M. & Samel, (2006) Aircraft noise effects on sleep: Application of the results of a large polysomnographic field study, Journal of Acoustical Society of America, 119(5), p.2772-2784, May 2006.

6   In this study "awakenings" implicitly means transitions from any of the following sleep stages: Rapid Eye Movement (REM), "deep sleep" comprising stages 3 or 4, or sleep stage 2, to either sleep stage 1, or awake.

2.16   Miedema and Vos (2007)[7] reported associations between self-reported sleep disturbance and environmental noise, based on a meta-analysis of pooled data from 24 studies. For their meta-analysis the noise dose used was the annual average L_{night} (11pm-7am). This complemented their earlier work on associations between self-reported daytime annoyance and environmental noise.

2.17   The results of the DLR sleep study were subsequently reflected in the World Health Organisation's (WHO) publication of Night Noise Guidelines (NNG) for Europe (2009)[8] which concluded that below 30 dB $L_{night,outside}$, no effects on sleep are observed except for a slight increase in the frequency of body movements during sleep due to night noise. It was concluded that there is not sufficient evidence that the biological effects observed at the level below 40 dB $L_{night,outside}$ are harmful to health. The NNG summarise the relationship between night noise and health effects into four ranges of continuous outside sound level at night (L_{night}):

- "<30 dB - Although individual sensitivities and circumstances differ, it appears that up to this level no substantial biological effects are observed.

- 30-40 dB - A number of effects on sleep are observed from this range: Body movements, awakening, self-reported sleep disturbance, and arousals. The intensity of the effect depends on the nature of the source and the number of events. Vulnerable groups (e.g., children, the chronically ill and the elderly) are more susceptible. However, even in the worst cases the effects seem modest.

- 40-55 dB - Adverse health effects are observed among the exposed population. Many people have to adapt their lives to cope with the noise at night. Vulnerable groups are more severely affected.

- >55 dB - The situation is considered increasingly dangerous for public health. Adverse health effects occur frequently, a sizeable proportion of the population is highly annoyed and sleep disturbed. There is evidence that the risk of cardiovascular disease increases".

2.18   WHO's view is that above 55 dB L_{night}, noise is a significant concern for public health. As a result WHO set an interim target of 55 dB $L_{night,outside}$. For the longer term it recommends that night noise exposure should be reduced below 40 dB $L_{night,outside}$. It is explained that the interim target is recommended in the situations where the achievement of the NNG is not feasible in the short-term for various reasons. With present technology, achievement of the 40 dB L_{night} target would

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[7]   Miedema, H. M. E., Vos, H. (2007) Associations between self-reported sleep disturbance and environmental noise based on reanalyses of pooled data from 24 studies. Behavioural Sleep Medicine, 5(1), 1-20.

[8]   Night Noise Guidelines for Europe, ISBN 978 92 890 4173 7, World Health Organisation, 2009.

require almost complete closure of all transport systems, including roads, railways and airports. The interim target is not a health-based limit value by itself and vulnerable groups cannot be protected at this level.

2.19   In 2018, WHO published their Environmental Noise Guidelines for the European Region[9], covering both daytime and night-time. For night noise exposure, the WHO strongly recommends reducing noise levels produced by aircraft during night-time below 40 dB L_{night}, (dropping the 55 dB L_{night} interim target set in 2009) as aircraft noise above this level is associated with adverse effects on sleep. The WHO define a strong recommendation as "one that can be adopted as policy in most situations. The guideline is based on the confidence that the desirable effects of adherence to the recommendation outweigh the undesirable consequences. The quality of evidence for a net benefit – combined with information about the values, preferences and resources – inform this recommendation, which should be implemented in most circumstances."

2.20   In summary, when investigating the impacts of environmental noise on sleep, it is important to remember that self-reported sleep disturbance can result in over-estimation compared to objective measurements of changes to sleep stages and awakenings. Laboratory studies result in higher levels of disturbance than in field settings, possibly due to a lack of habituation to a laboratory environment. Disturbance increases with noise dose, but if the noise level is below the threshold that triggers a response then the noise dose is not relevant. During sleep a certain number of spontaneous awakenings is usual and is often not a reaction to external stimuli.

2.21   It is stressed that this report is an exploratory study that further examines data from the SoNA 2014 study, which was not specifically designed for sleep disturbance investigation. Question CAN1vii asks respondents if they are 'bothered, annoyed or disturbed' by aircraft noise in the period 11pm to 7am, and it is the responses to this question which will be used as a proxy for sleep disturbance in this supplementary analysis.

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9   Environmental Noise Guidelines for the European Region, ISBN 978 92 890 5356 3, World Health Organisation, 2018.

Chapter 3
Methodology

3.1   Information provided here is specific to the analysis of attitudes to night noise. More detailed methodology for SoNA 2014 is provided in CAP 1506: Second Edition[1] which dealt with daytime annoyance.

3.2   For analysis of attitudes to night noise, the SoNA 2014 face-to-face interview sample of 1,999 from around eight airports was reduced to 1,588 adults aged 18 years and over living in residential dwellings in vicinity of three airports in England: Gatwick, Heathrow and Stansted. This was done to focus on the three airports designated for noise control purposes where Government sets night noise controls, and with more comprehensive night noise exposure data available. Of the 1,588 residents interviewed at these airports, 100 stated they had recently moved into the area and did not live there during summer 2014 and thus were excluded from the analysis, giving a sample total of 1,488. Five of these respondents answered don't know to the night-time noise disturbance question (CAN1vii) and were excluded from the analysis, leaving a sample of 1,483.

3.3   This chapter briefly summarises the SoNA 2014 questionnaire design process, the survey design and sample selection.

Sampling

3.4   Because the primary study objective was an analysis of attitudes to daytime aircraft noise, sampling was based on daytime noise exposure. Consequently, there was no direct control over selection of night noise exposure levels. Details on the distribution of night noise exposure levels are presented in Chapter 5.

Questionnaire design

3.5   The survey questionnaire, as provided in Appendix B, comprised five sections:

1. A general section

2. An optional Road Traffic Noise section

3. An optional Neighbour Noise section

4. A Civil Aircraft Noise section

5. A Health section

3.6   The SoNA 2014 questionnaire design was both peer-reviewed and underwent cognitive testing to confirm people's understanding of the questions asked, and to identify any need for questionnaire improvement and simplification.

Survey Design

3.7   The noise survey questionnaire, the selection and sampling process are reported and covered separately in Ipsos MORI's 2014 Survey of Noise Attitudes (SoNA) technical report[10], which provides more detailed information on the sample strategy agreed, response rates, demographics of participants, survey questionnaire including show cards and diagrams showing areas sampled.

3.8   The survey was conducted via face-to-face in-home interviews with residents aged 18 and over who lived in the vicinity of nine airports in England and took approximately 35 minutes to complete. The survey employed a random probability methodology and was conducted with adults randomly chosen within their household. Although the annoyance survey was based around respondents from nine airports, this night noise survey analysis is based on a subset of respondents from three airports.

3.9   Fieldwork was conducted between 5 October 2014 and 8 February 2015. The survey selected respondents at random, according to the populations around the sample airports.

Noise Modelling

3.10   The main reference period for the noise exposure was the 2014 average summer night (16th June to 15th September inclusive). Although interviews took place from early October 2014 through to February 2015, respondents were asked their views on night noise during summer 2014. Previous studies[11] have shown that noise attitudes may be more highly correlated with noise exposure just prior to interview. To test for this hypothesis, each night noise indicator was also estimated based on the runways used during the 7 days and 30 days immediately preceding interview. This is discussed in more detail in paragraph 3.12.

3.11   To enable questionnaire responses to be correlated with noise exposure information, noise exposure was estimated for the following indicators:

- Average summer night $L_{Aeq,8h}$ (11pm-7am)

- Average annual L_{night} (11pm-7am)

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[10]   The 2014 Survey of Noise Attitudes (SoNA) Technical Report, Ipsos MORI, CAP 1506a, 22 June 2015.

[11]   Brooker etal (1985). Brooker P, Critchley J B, Monkman D J & Richmond C. 'United Kingdom Aircraft Noise Index Study: main report', DR Report 8402, Civil Aviation Authority, January 1985.

▪ Average summer night N60 (11pm-7am)

Effect of runway direction

3.12   As described in detail in CAP 1506, to examine the effects of changes in noise exposure in the time preceding interview, for each respondent's dwelling location, noise exposure was re-estimated for four different temporal variations:

▪ 92-day summer average modal split

▪ 30-day average modal split prior to interview

▪ 7-day average modal split prior to interview

▪ Summer day highest noise level from either the 100% westerly or 100% easterly modes

Likelihood of being highly sleep disturbed

3.13   The introduction explained that a key objective of this analysis is to obtain, as far as possible, new and updated evidence on attitudes to sleep disturbance from aircraft. A key output of the analysis is an updated dose response function, based on the limited analysis available, that estimates the likelihood of being highly sleep disturbed as a function of night-time noise exposure.

Chapter 4
Social Survey Results

Introduction

4.1   This chapter presents an overview of the social survey results used in the night analysis. It includes information on:

- Demographic, household and dwelling characteristics of the sample respondents

- Self-reported sleep disturbance due to aircraft noise and other sources at night

- Noise sensitivity

Demographic, Household and Dwelling Information for the SoNA 2014 and SoNA 2014 Sleep samples

4.2   The sample in this report comprises responses from residents around Heathrow, Stansted and Gatwick airports only (see para 3.2). Table 1 shows the SoNA Sleep 2014 sample demographic, household and dwelling information compared alongside the full SoNA 2014 sample.

Table 1: Demographic Information for SoNA 2014 and SoNA Sleep 2014

SoNA Sleep 2014 Demographic Information, compared with SoNA 2014		
	SoNA Sleep 2014	**SoNA 2014**
	N=1,483	**N=1,847**
	% (N)	**% (N)**
How long have you lived in this home? (Question A1)		
Less than 6 months	1.6 (24)	2.4 (44)
6 months - 1 year	7.8 (115)	7.9 (146)
1 - 2 years	11.5 (170)	12.1 (223)
2 - 5 years	18.0 (267)	17.0 (314)
5 - 10 years	17.1 (254)	16.5 (304)
10 years or more	44 (652)	43.9 (812)
Don't know	0.1 (1)	0.2 (3)
Home ownership (Question H3)		
Being bought on a mortgage	26.8 (397)	27.4 (507)
Owned outright by household	26.5 (393)	24.2 (447)
Rented from local authority	16.3 (242)	16.0 (295)
Rented from housing association	10.1 (150)	10.5 (193)
Rented from private landlord	18.0 (267)	19.2 (354)
Shared ownership	0.6 (9)	0.6 (11)
Tied to employment	0.5 (7)	0.2 (4)
Other	0.6 (9)	1.1 (20)
Don't know	0.6 (9)	0.9 (17)
How did you come to be living here (Question H4)		
My choice	46.7 (693)	42.5 (785)

SoNA Sleep 2014 Demographic Information, compared with SoNA 2014		
Choice made with someone else in the household	37 (548)	39.0 (721)
Choice made by someone else in the household	5.3 (78)	7.1 (130)
Choice made by landlord (e.g. Local Authority, housing association)	9.2 (136)	9.8 (181)
Choice made by someone else outside the household, e.g. employer	0.9 (13)	0.6 (11)
Born here	0.2 (3)	0.2 (4)
Convenient for family / work / school	0.2 (3)	0.1 (2)
Inherited the property	0.3 (4)	0.1 (3)
The property owner is my partner / I moved in	0.1 (2)	0 (0)
Other	0.1 (2)	0.2 (3)
Refused	0.1 (2)	0.3 (6)
Age of respondent (Question H5)		
16-17 years	n/a	n/a
18 – 19 years	1.5 (22)	2.3 (42)
20 – 24 years	4.1 (61)	6.0 (111)
25 – 34 years	17.3 (257)	20.7 (383)
35 – 44 years	22.4 (332)	22.0 (407)
45 – 54 years	18.4 (273)	17.4 (321)
55 – 64 years	14.0 (208)	14.2 (263)
65 – 74 years	13.3 (197)	10.7 (197)
75 years or older	8.6 (127)	6.3 (116)
Refused	0.4 (6)	0.4 (8)
Gender of respondent (Question H6)		
Male	48.1 (714)	49.1 (907)
Female	51.9 (769)	50.9 (940)
Any infants, children or teenagers in household (0-17 years) (Question H7a)		
No	70.7 (1049)	69.5 (1284)
Yes	29.3 (434)	30.5 (563)
Employment Status of respondent (Question H8)		
Working full time (30 hours a week or more)	49.9 (740)	52.1 (962)
Working part time	12.1 (180)	12.0 (221)
Unemployed and looking for work	3 (44)	4.2 (78)
Retired from paid work altogether	22 (327)	17.6 (324)
In full-time education	2.5 (37)	3.7 (68)
Looking after the home or family	7.1 (105)	6.8 (125)
Something else	3 (45)	3.3 (62)
Refused	0.3 (5)	0.3 (6)
Working at home (Question H9a)[12]		
Sometimes work at home	34.0 (313)	30.5 (361)
How many days in a typical week do you work from home? (Question H9b)[13]		
Less than 3	58.7 (183)	68.6 (214)
3 to 4	14.1 (44)	13.4 (42)
5 to 7	16.3 (51)	18.2 (57)
Varies	10.9 (34)	14.5 (45)

[12] Based on responses to question H8, the SoNA 2014 sleep sample had 920 respondents in full or part-time work, whereas the main SoNA 2014 sample had 1,184 respondents in full or part-time work.

[13] Based on responses to question H9a, the SoNA 2014 sleep sample had 312 respondents in full or part-time work at home, whereas the main SoNA 2014 sample had 361 respondents in full or part-time work at home.

SoNA Sleep 2014 Demographic Information, compared with SoNA 2014		
Don't know	0.3 (1)	1.1 (4)
Social grade of head of household (Question H13a)		
A/B	24.5 (364)	25.4 (470)
C1	35.1 (520)	36.2 (669)
C2	17.3 (257)	15.2 (281)
D	11.8 (175)	12.4 (229)
E	10.4 (154)	9.8 (180)
Refused	0.9 (13)	0.9 (17)

NB: the question numbers in the table reflect the numbering in SoNA 2014, not SoNA 2013. The N for each variable/question may add to ±1 of the expected sample totals due to weighting and rounding.

4.3   Table 2 presents dwelling information for the SoNA 2014 samples.

Table 2: Dwelling information for each SoNA 2014 sample

SoNA 2014 Sleep Dwelling Information, compared with SoNA 2014		
	SoNA Sleep 2014 **N=1,483**	**SoNA 2014** **N=1,847**
	% (N)	
Type of house (Question A2)		
Purpose built flat/maisonette	32.2 (478)	31.6 (584)
Converted flat/maisonette	7.4 (110)	8.9 (165)
Semi-detached/end of terrace house	18.9 (281)	20.0 (370)
Mid-terrace house	10.2 (152)	11.7 (216)
Detached house	10.2 (151)	8.0 (148)
Bungalow	19.3 (286)	18.3 (337)
Cluster home	0.6 (9)	0.6 (11)
Other	1.1 (16)	0.8 (15)
Access to garden or other private outdoor space (Question A3)		
No	28.8 (427)	29.6 (546)
Yes	71.2 (1056)	70.4 (1300)
Double glazing in the home (Question Dblglaze)		
Missing information	5.0 (74)	5.1 (95)
Yes	66.4 (985)	69.1 (1275)
No	12.4 (184)	12.5 (231)
Don't know	16.2 (240)	13.3 (245)
Age of home (Question H2)		
Before 1919	17.8 (264)	16.0 (295)
1919 – 1940	17.3 (257)	16.3 (301)
1941 – 1960	15.2 (226)	14.0 (258)
1961 – 1990	17.5 (259)	17.2 (318)
1991 – 2000	5.3 (78)	5.8 (106)
2001 – 2010	4.0 (59)	4.8 (90)
2011 – 2014	0.7 (10)	0.7 (14)
Don't know	22.3 (330)	25.2 (465)

4.4   Overall, the results are largely very similar for the two SoNA 2014 samples.

Noise Sensitivity

4.5   Question A7b sought views on the degree of noise sensitivity respondents reported themselves to have, the results of which are presented in Table 3.

Table 3: Self-reported Noise Sensitivity

Question A7b Noise Sensitivity		
	SoNA Sleep 2014	**SoNA 2014**
	% (N)	**% (N)**
1 Not at all sensitive	13.4% (198)	17.2% (410)
2	17.9% (265)	16.7% (397)
3	16.8% (248)	15.3% (364)
4	22.9% (339)	19.7% (470)
5	13.1% (193)	15.8% (377)
6	7.5% (112)	5.9% (141)
7 Highly sensitive	8.4% (124)	9.3% (222)

4.6   Question 8b asked: "Thinking about the last 12 months or so, what number from 0 to 10 best shows how much you are bothered, disturbed or annoyed by noise from outside your own home?" The answers were given on an 11-point scale from 0 "Not at all", to 10 "Extremely".

0 Not at all	1	2	3	4	5	6	7	8	9	10 Extremely
○	○	○	○	○	○	○	○	○	○	○

4.7   The median response for the night sample was a score of 5, given by 13% of respondents. Just over 46% of the sample answered Not at all, 1, 2 or 3.

Chapter 5
Noise Exposure and Sleep disturbance

Introduction

5.1   This chapter addresses the following aims in this study:

- Examine the frequency of respondents who are affected by aircraft noise at night versus overall noise from aircraft.

- Investigate the relationship between self-reported sleep disturbance and noise exposure.

5.2   Analysis has been undertaken using two separate night noise metrics to quantify the noise dose. Firstly, the average summer night metric, $L_{Aeq,8h}$, which is an equivalent continuous noise level for the aircraft activity for the 8-hour night period (11pm-7am) during the 92-day summer period (16 June – 15 September). Secondly, the annual average night metric, L_{night}, which is an equivalent continuous noise level for the aircraft activity for the 8-hour night period (11pm-7am) during a calendar year.

Number of Respondents by Noise Exposure

5.3   Residents were selected based on daytime summer 2013 noise exposure levels. It is, however, recognised that runway modal split (direction of use) varies from month to month, summer to summer and between day and night. Table 4 compares the runway modal split between average summer day 2013 and average summer day and night 2014.

Table 4: Runway modal split between average summer day 2013 and average summer day and night 2014

Airport	Summer Night 2014 modal split % West/% East	Summer Day 2014 modal split	Summer Day 2013 modal split % West/% East
Gatwick	60%/40%	64%/36%	69%/31%
Heathrow	66%/34%	68%/32%	74%/26%
Stansted	70%/30%	54%/46%	71%/29%

5.4   The main difference between SoNA 2014 and the SoNA Sleep study in terms of modal split was seen at Stansted, with a higher westerly percentage for an average summer night (70%/30% west/east) compared to 54%/46% west/east respectively, however, this only applies to the 15 respondents at Stansted.

5.5 Tables 5 to 7 show the numbers of responses obtained at the three airports for the three noise exposure variables used in this analysis. Table 5 shows the respondents categorised by the 2014 average annual $L_{Aeq,8h}$ contour bands.

Table 5: Respondents categorised by 2014 average summer night $L_{Aeq,8h}$ (N=1,483)

Average summer night $L_{Aeq,8h}$ (dB)	Gatwick	Airport Heathrow	Stansted	Total
<42	0	208	0	208
42-44.9	8	241	0	249
45-47.9	45	325	3	373
48-50.9	55	242	8	305
51-53.9	61	140	1	202
≥54	33	110	3	146
Total	**202**	**1,266**	**15**	**1,483**

5.6 Table 6 shows the respondents categorised by the 2014 average annual L_{night} contour bands. The same bands were used as for average summer night $L_{Aeq,8h}$ to provide consistency with the width of each band and number of bands. This is appropriate as unlike L_{den}, L_{night} is unweighted and because it is averaged over a whole year, L_{night} values tend to be lower than average summer night $L_{Aeq,8h}$ values.

Table 6: Respondents categorised by 2014 average annual night L_{night} (N=1,483)

Average annual night L_{night} (dB)	Gatwick	Airport Heathrow	Stansted	Total
<42	7	242		249
42-44.9	40	227	0	267
45-47.9	47	323	4	374
48-50.9	67	234	7	308
51-53.9	24	127	3	154
≥54	17	113	1	131
Total	**202**	**1,266**	**15**	**1,483**

5.7 Table 7 shows respondents categorised by 2014 summer average number of events ≥60 dB L_{ASmax} (N60).

Table 7: respondents categorised by 2014 average summer night number of events ≥60 dB L$_{ASmax}$ (N60) (N=1,483)

Average summer night number of events of ≥60 dB L$_{ASmax}$	Airport			
	Gatwick	**Heathrow**	**Stansted**	**Total**
<1	0	22	0	22
1-9.9	12	370	0	382
10-19.9	25	388	3	416
20-29.9	20	306	7	333
30-39.9	24	154	5	183
≥40	121	26	0	147
Total	**202**	**1,266**	**15**	**1,483**

5.8   The majority of the sample (28%) fell into the 10-19.9 events of ≥60 dB L$_{ASmax}$, reflecting the typical nightly usage at Heathrow airport, closely followed by 26% experiencing 1-10 events of ≥60 dB L$_{ASmax}$. 10% of the sample experienced 40 or more events[14] per night of ≥60 dB L$_{ASmax}$, with the majority of these being respondents affected by Gatwick.

Survey Questions on Night-Time Disturbance

5.9   Whereas guidance is provided by ISO and ICBEN on the recommended format for questions relating to annoyance, there is no such guidance relating to night-time annoyance or self-reported sleep disturbance. The questionnaire nevertheless included a question using the ISO/ICBEN format, but specifically with respect to night-time disturbance and a second question seeking information on the extent to which respondent's sleep was disturbed.

5.10   All respondents who had been resident at their current address during summer 2014 were asked questions on Civil Aircraft Noise.

5.11   Disturbance due to night-time aircraft was recorded using the standardised annoyance question defined by ISO[15] with a five-point verbal rating scale (CAN1) which included a night noise element (CAN1vii).

5.12   CAN1 was presented as a matrix question, seeking views on overall annoyance from civil aircraft, but also views on noise associated with specific types of operation and specific times of day.

5.13   Responses to CAN1vii are focused on for the purposes of this report.

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[14] The highest average summer night exposure was 64.9 events ≥60 dB L$_{ASmax}$.

[15]   ISO/TS 15666:2003, Assessment of noise annoyance by means of social and socio-acoustic surveys, Technical Specification, first edition, 1st February 2003.

CAN1: So, thinking about this summer, when you were here at home, how much did each of these different types of noise from aeroplanes bother, disturb or annoy you?

	Not at all	Slightly	Moderately	Very	Extremely	Don't know
i. Overall noise of all kinds, from aeroplanes	O	O	O	O	O	O
ii. Noise from aeroplanes on the ground at an airport (e.g. taxiing planes, engine testing)	O	O	O	O	O	O
iii. Noise from aeroplanes taking off and climbing	O	O	O	O	O	O
iv. Noise from aeroplanes descending and landing	O	O	O	O	O	O
v. Noise from aeroplanes in flight	O	O	O	O	O	O
vi. Noise from aeroplanes during the day (7 a.m. - 11 p.m.)	O	O	O	O	O	O
vii. Noise from aeroplanes during the night (11 p.m. - 7 a.m.)	O	O	O	O	O	O

5.14   Question CAN 7b also addressed attitudes to aircraft noise at night, including reference to sleep disturbance, and used the ISO 11-point scale.

CAN7b: Thinking about the summer, when you were here at home, what number from 0 to 10 best shows the degree to which your sleep was disturbed by noise from aeroplanes?

0 Not at all	1	2	3	4	5	6	7	8	9	10 Extremely	Don't know
O	O	O	O	O	O	O	O	O	O	O	O

5.15   However, question CAN7b was preceded by a screening question (CAN7a), that eliminated 388 respondents who stated that their sleep was not disturbed by noise from aeroplanes, resulting in a sample size of 1,095. Analysis of CAN1vii using that sample had a material effect on the overall CAN1vii average night-time disturbance scores causing the overall mean disturbance score to increase from 29.2 to 35.9. Therefore, the results of CAN7b have not been used.

Night-time Disturbance Scores

5.16   Although the elimination of question CAN7b meant that there was no strict requirement to transform the 5-point scale to a 100-point scale, this was still done as it has become standard practice to transform annoyance scales used in such surveys onto a 100-point scale[1]:

$$\text{Annoyance Score}_i = 100(i-1/2)/m$$

5.17   This gives the relationship for the 5-point scale and night-time disturbance score shown in Table 8.

**Table 8: Transformation of the 5 scale to a 100-point scale**

Disturbance category	5-point verbal scale	
	Scale boundary	Scale mid-point
Not at all	0-19.9	10
Slightly	20-39.9	30
Moderately	40-59.9	50
Very	60-79.9	70
Extremely	80-100	90

5.18   Table 9 and Figure 1 shows the mean disturbance score for question CAN1vii, transformed to the 100-point scale, as a function of average summer night $L_{Aeq,8h}$ noise band. Figure 1 also includes 95% confidence intervals around the mean disturbance scores.

Table 9: Mean disturbance scores in SoNA 2014 night survey as a function of average summer night $L_{Aeq,8h}$ noise exposure

Average summer night $L_{Aeq,8h}$ (dB)	N	CAN1vii Mean	95% Confidence Interval
<42	208	18.2	±1.9
<42-44.9	249	20.8	±2.2
45-47.9	373	25.9	±2.4
48-50.9	305	35.6	±3.2
51-53.9	202	39.2	±3.8
≥54	146	40.0	±4.3
Total	**1,483**	**-**	**-**

Figure 1: Plot of mean night disturbance scores in SoNA 2014 night survey as a function of average summer night $L_{Aeq,8h}$ noise exposure
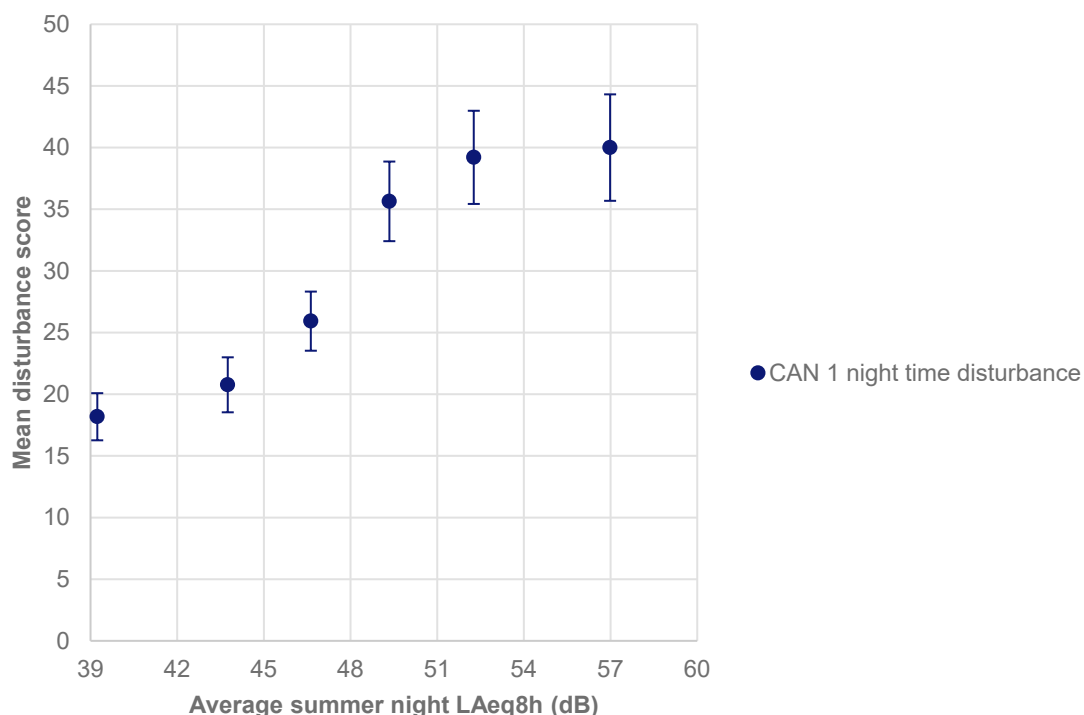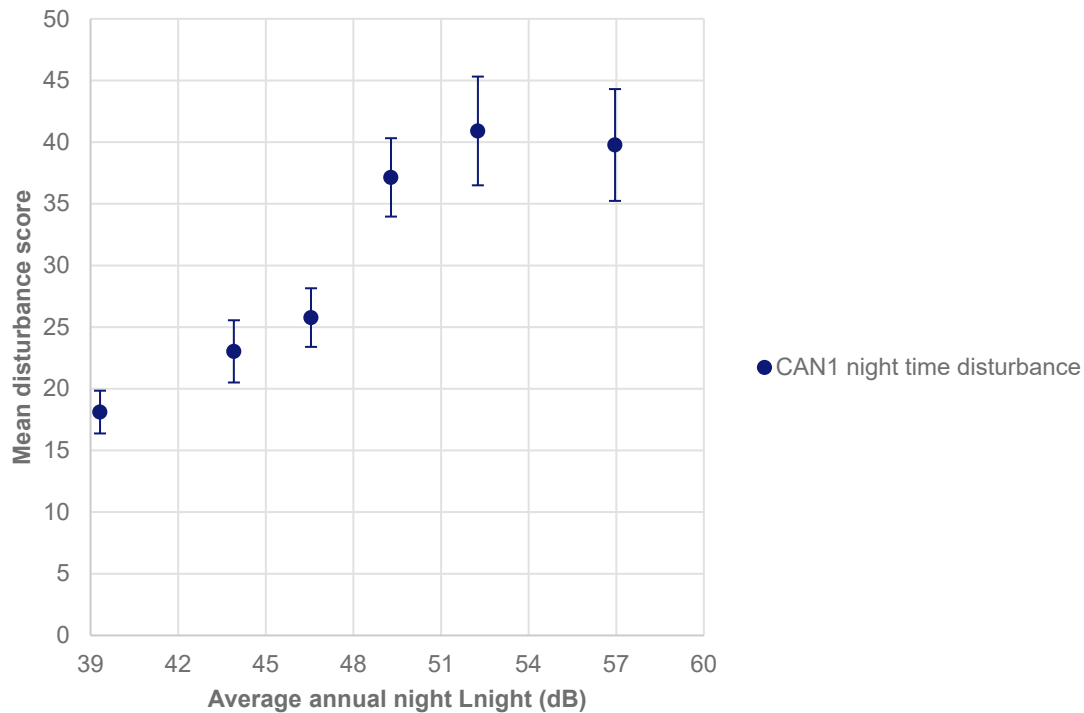

5.19   The response was significantly associated with average summer night $L_{Aeq,8h}$ (p<0.001).

5.20   Table 10 and Figure 2 show the mean disturbance score for question CAN1vii, transformed to the 100-point scale, as a function of average annual night L_{night} noise band. Figure 2 also includes 95% confidence intervals around the mean disturbance scores.

Table 10: Mean disturbance scores in SoNA 2014 survey as a function of average annual night L_{night} noise exposure

Average annual night L_{night} (dB)	N	CAN1vii Mean	95% Confidence Interval
<42	249	18.1	±1.7
42-44.9	267	23.0	±2.5
45-47.9	374	25.8	±2.4
48-50.9	308	37.1	±3.2
51-53.9	154	40.9	±4.4
≥54	131	39.8	±4.5
Total	**1,483**	-	-

Figure 2: Plot of mean night disturbance scores in SoNA 2014 night survey as a function of average annual night L_{night} noise exposure

5.21   The response was significantly associated with annual average night L_{night} (p<0.001).

5.22   Table 11 and Figure 3 show the mean disturbance scores for question CAN1vii transformed to the 100-point scale, as a function of average summer night number of events ≥60 dB L_{ASmax}. Figure 3 also includes 95% confidence intervals around the mean disturbance scores.

Table 11: Mean disturbance scores in SoNA 2014 night survey as a function of average summer night, 8-hour number of events ≥60 dB L_{ASmax}

| Average summer night 8h number of events ≥60 dB L_{ASmax} | CAN1vii | | |
	N	Mean	95% Confidence Interval
<1	22	13.6	±4.3
1-9.9	382	22.9	±2.0
10-19.9	416	27.2	±2.3
20-29.9	333	31.1	±2.8
30-39.9	183	37.3	±4.3
≥40	147	38.8	±4.3
Total	**1,483**	**29.2**	**-**

Figure 3: Plot of mean night disturbance scores in SoNA 2014 night survey as a function of average summer night number of events ≥60 dB L_{ASmax}
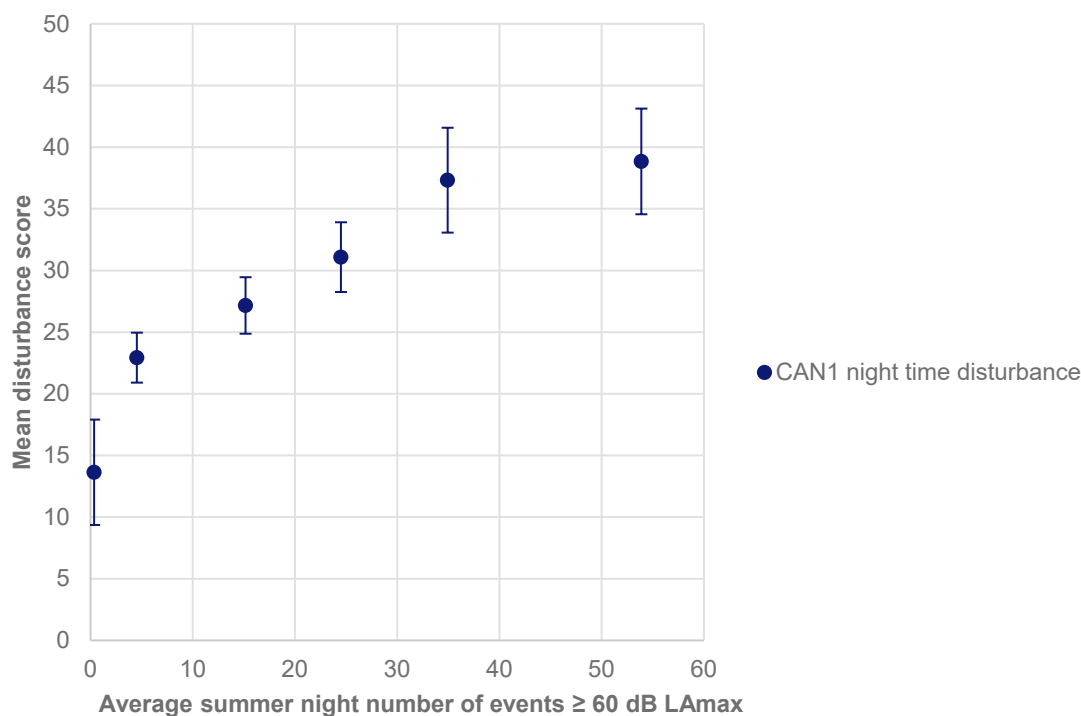
5.23 The response was significantly associated with average summer night N60 (p<0.001).

Relationship between different noise indicators and mean disturbance score

5.24 To identify whether one noise indicator is more strongly associated with mean disturbance score, a logistic function was fitted through the mean disturbance scores plotted for each noise indicator. A logistic function[16] is preferred as it is naturally bounded between 0 and 100, unlike other types of functions. The correlation of determination (r^2) of a logistic function fitted using ordinary least-squares regression for each noise indicator is shown in Table 12.

Table 12: Correlation between CAN1vii and various noise indicators

Night-time disturbance (CAN1vii)	N	r^2
Average summer 8-hour night L_{Aeq}	1,483	0.883
Average annual 8-hour night L_{night}	1,483	0.842
Average summer 8-hour night N60	1,483	0.822

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[16] The data points are close to linear and correlation does not significantly change whether a linear, polynomial or logistic function is used. A logistic function, however, avoids the situation where a linear or polynomial function predicts zero or negative annoyance at low noise exposure.

5.25   All three noise indicators are highly correlated (high r^2 value) with night-time self-reported sleep disturbance rating. It is plausible that L_{night} is inferior to $L_{Aeq,8h}$ as both Gatwick and Stansted airports experience significant seasonality with greater numbers of night flights during the summer months. N60 is found to correlate almost as well as L_{Aeq8h} and L_{night}. Based on this exploratory analysis, there is insufficient evidence to change from the current practice of using average summer night $L_{Aeq,8h}$ noise exposure for UK assessments (though further research is recommended in 100% mode $L_{Aeq,8h}$ – see paragraph 5.29).

Effect of runway direction

5.26   Noise exposure levels at individual locations may be substantially affected by the direction of use of an airport's runway (see CAP 1506 for further explanation).

5.27   To examine the effects of changes in $L_{Aeq,8h}$ noise exposure in the time preceding interview, for each respondent's dwelling location, noise exposure was re-estimated for four different temporal variations:

- 92-day summer average modal split

- 30-day summer average modal split prior to interview

- 7-day summer average modal split prior to interview

- Summer day highest noise level from either the 100% westerly or 100% easterly modes

5.28   Table 13 shows the correlations between night-time disturbance score from CAN1vii and the various temporal variations.

Table 13: Correlations between CAN1vii and temporal mode

Night-time disturbance (CAN1vii)	N	r^2
92-day average mode	1483	0.883
30-day average mode	1483	0.889
7-day average mode	1483	0.857
Highest noise level of either westerly or easterly mode	1483	0.908

5.29   There are strong correlations between the night-time disturbance score and noise exposure for all of the temporal modes examined. For CAN1vii the best correlation is with the highest noise level of either westerly or easterly mode. However, it should be noted that all r^2 represent good correlations between mode and rating in these instances, and there is little difference between these correlations. Thus, there is no compelling evidence for a change of practice from using average summer-night. The use of average-summer night also accords with the temporal period used for daytime assessment. However, it is

recommended that future studies investigate associations with the highest noise level of either westerly or easterly mode.

Percentage Highly Sleep Disturbed

5.30 Following on from Miedema's work on noise annoyance, Miedema also applied a cut-off of 72 on a 100-point scale to define being 'highly sleep disturbed'[7].

5.31 Using the 100-point scale in Table 8, the cut-off for the 5-point scale is:

- 5-point scale: 'Extremely Sleep Disturbed' (category 5) + 0.4 x 'Very Sleep Disturbed' (category 4), i.e. all those in the 'Extremely Sleep Disturbed' (category 5) and 40% of those in the 'Very Sleep Disturbed' (category 4)

5.32 Table 14 shows the distribution of night disturbance responses to CAN1vii as a function of average summer night $L_{Aeq,8h}$.

Table 14: Distribution of night disturbance responses to CAN1vii question as function of $L_{Aeq,8h}$ (N=1,483)

Average summer night $L_{Aeq,8h}$ (dB)	Not at all % (N)	Slightly % (N)	Moderately % (N)	Highly Sleep Disturbed Very % (N)	Highly Sleep Disturbed Extremely % (N)	Total % (N)	Highly Sleep Disturbed % (N)
<42	68.3% (142)	25.0% (52)	4.3% (9)	2.4% (5)	0% (0)	100% (208)	**1.0% (2.0)**
<42-44.9	66.5% (163)	20.9% (52)	9.2% (23)	3.2% (8)	1.2% (3)	100% (249)	**2.5% (6.2)**
45.0-47.9	58.2% (217)	20.4% (76)	9.7% (36)	7.2% (27)	4.6% (17)	100% (373)	**7.5% (27.8)**
48.0-50.9	43.0% (131)	20.3% (62)	13.8% (42)	11.5% (35)	11.5% (35)	100% (305)	**16.1% (49.0)**
51.0-53.9	34.2.% (69)	19.8% (40)	20.8% (42)	16.3% (33)	8.9% (18)	100% (202)	**15.4% (31.2)**
≥54	30.1% (44)	22.6% (33)	23.3% (34)	15.1% (22)	8.9% (13)	100% (146)	**14.9% (21.8)**
Total	**51.7% (766)**	**21.2% (315)**	**12.5% (186)**	**8.8% (130)**	**5.8% (86)**	**100% (1,483)**	**9.3% (138)**

5.33 The percentage highly sleep disturbed is roughly equal at nearly 15% for each category from 48 dB $L_{Aeq,8h}$ upwards. A third of the sample report that they are not at all disturbed at night from aircraft noise (33%).

5.34 The percentage of respondents calculated as highly sleep disturbed is also plotted in Figure 4.

Figure 4: Percentage of respondents calculated as highly sleep disturbed as a function of average summer night $L_{Aeq,8h}$
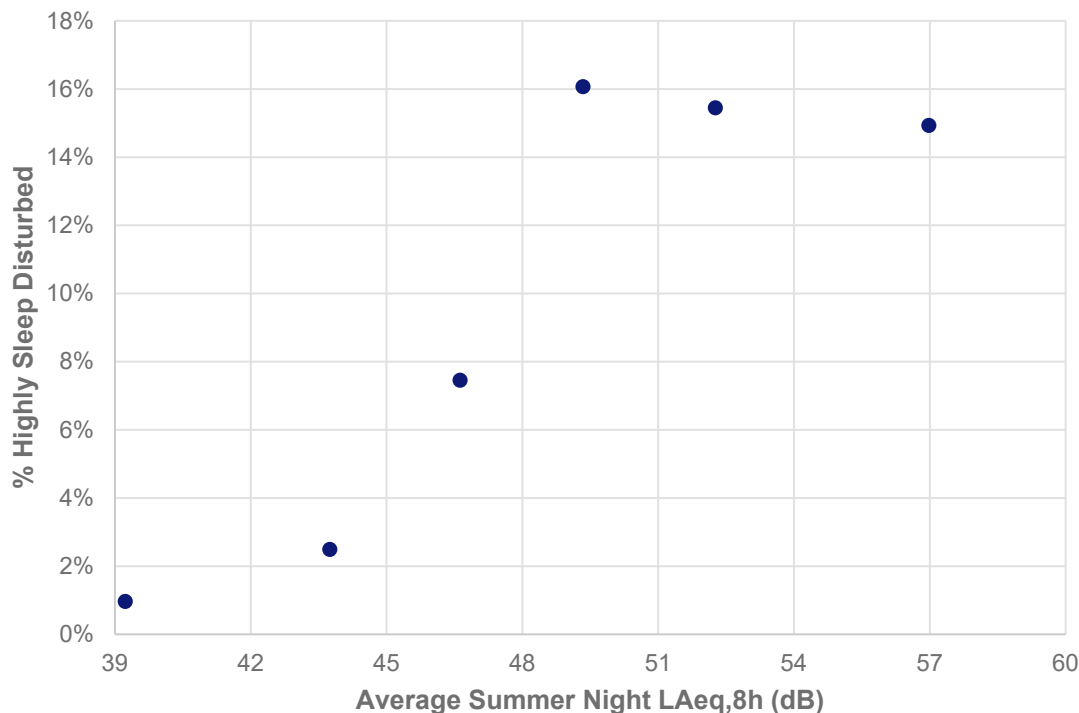

5.35   There is a clear increase between 42 and 48 dB $L_{Aeq,8h}$, with a levelling off above 48 dB.

5.36   Table 15 and Figure 5 shows the distribution of night disturbance responses to CAN1vii as a function of annual average L_{night}.

Table 15: Percentage of respondents indicating high self-reported sleep disturbance for CAN1vii by annual average L_{night} (total n=1,483)

Average annual L_{night} (dB)	Not at all % (N)	Slightly % (N)	Moderately % (N)	Very % (N)	Extremely % (N)	Total % (N)	Highly Sleep Disturbed % (N)
<42	68.3% (170)	25.3% (63)	4.0% (10)	2.4% (6)	0% (0)	100% (249)	1.0% (2.4)
<42-44.9	63.3% (169)	18.4% (49)	11.2% (30)	4.1% (11)	3.0% (8)	100% (267)	4.6% (12.4)
45.0-47.9	58.0% (217)	21.1% (79)	9.4% (35)	7.0% (26)	4.5% (17)	100% (374)	7.3% (27.4)
48.0-50.9	39.9% (123)	19.8% (61)	14.9% (46)	15.3% (47)	10.1% (31)	100% (308)	16.2% (49.8)
51.0-53.9	30.5% (47)	22.1% (34)	22.1% (34)	13.0% (20)	12.3% (19)	100% (154)	17.5% (27)
≥54	30.5% (40)	22.1% (29)	23.7% (31)	15.3% (20)	8.4% (11)	100% (131)	14.5% (19)
Total	**51.7% (766)**	**21.2% (315)**	**12.5% (186)**	**8.8% (130)**	**5.8% (86)**	**100% (1,483)**	**9.3% (138)**

Figure 5: Percentage of respondents calculated as highly sleep disturbed as a function of annual average L_{night}[17]
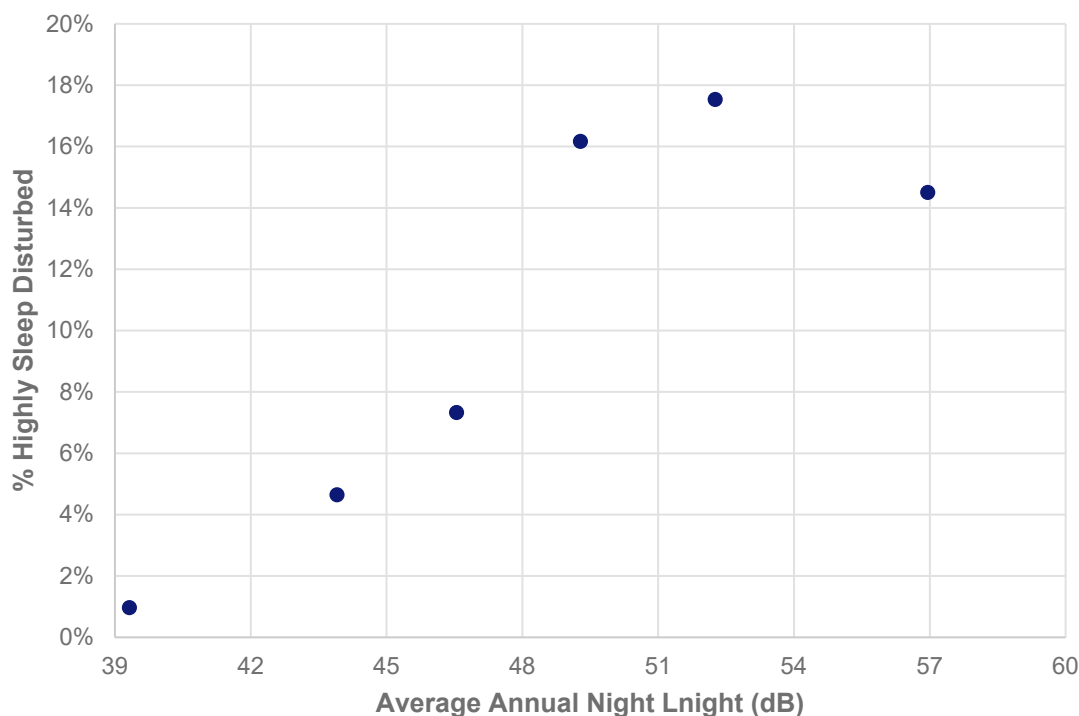
5.37   Responses are very similar to $L_{Aeq,8h}$, since L_{night} and $L_{Aeq,8h}$ are themselves highly correlated since the SoNA 2014 sample is dominated by Heathrow with similar numbers of night flights year-round.

5.38   Table 16 and Figure 6 shows the distribution of night disturbance responses to CAN1vii as a function of average summer night N60.

Table 16: Percentage of respondents indicating high self-reported sleep disturbance for CAN1vii for by average summer night N60 (total n=1,483)

Average summer night 8h number of events ≥60 dB L_{ASmax}	Not at all % (N)	Slightly % (N)	Moderately % (N)	Highly Sleep Disturbed Very % (N)	Extremely % (N)	Total % (N)	Highly Sleep Disturbed % (N)
<1	86.4% (19)	9.1% (2)	4.5% (1)	0% (0)	0% (0)	100% (22)	0% (0)
1-9	59.9% (229)	25.4% (97)	7.6% (29)	4.2% (16)	2.9% (11)	100% (382)	4.6% (17.4)
10-19	54.6% (227)	22.1% (92)	10.8% (45)	7.9% (33)	4.6% (19)	100% (416)	7.7% (32.2)
20-29	49.8% (166)	18.3% (61)	15.6% (52)	9.0% (30)	7.2% (24)	100% (333)	10.8% (36)
30-39	41.0% (75)	19.1% (35)	14.8% (27)	12.6% (23)	12.6% (23)	100% (183)	17.6% (32.2)
≥40	34.0% (50)	19.0% (28)	21.8% (32)	19.0% (28)	6.1% (9)	100% (147)	13.7% (20.2)

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17   For the <42 and ≥54dB L_{night} categories, the average noise dose is the average measured noise dose for the the respondents in these categories.

Average summer night 8h number of events ≥60 dB L_{ASmax}	Not at all % (N)	Slightly % (N)	Moderately % (N)	Highly Sleep Disturbed		Total % (N)	Highly Sleep Disturbed % (N)
				Very % (N)	Extremely % (N)		
Total	51.7% (766)	21.2% (315)	12.5% (186)	8.8% (130)	5.8% (86)	100% (1,483)	9.3% (138)

Figure 6: Percentage of respondents calculated as highly sleep disturbed as a function of average summer night N60[18]
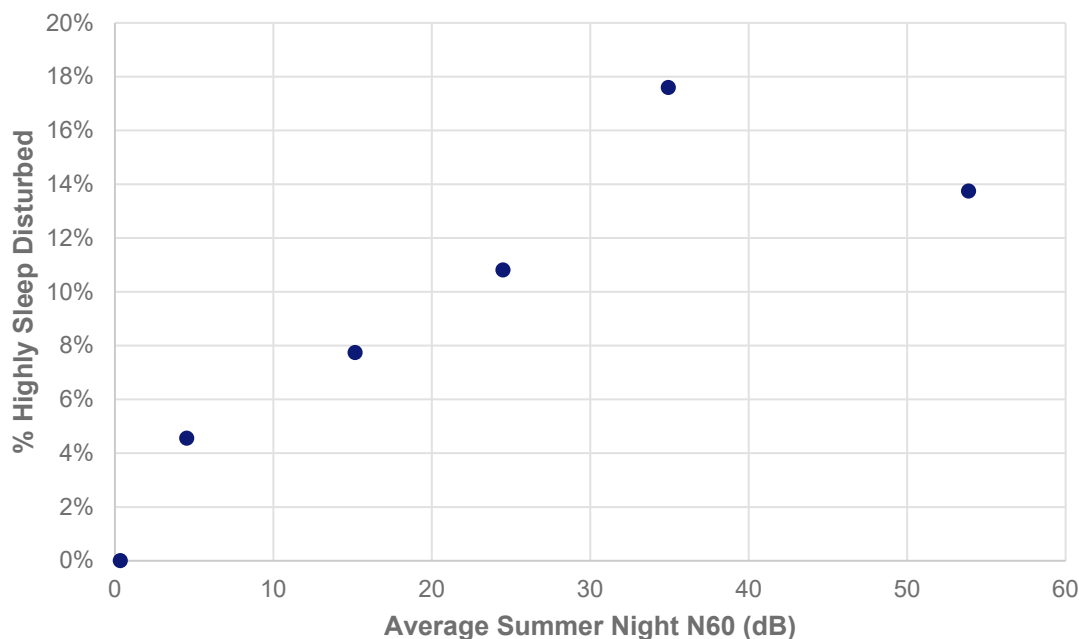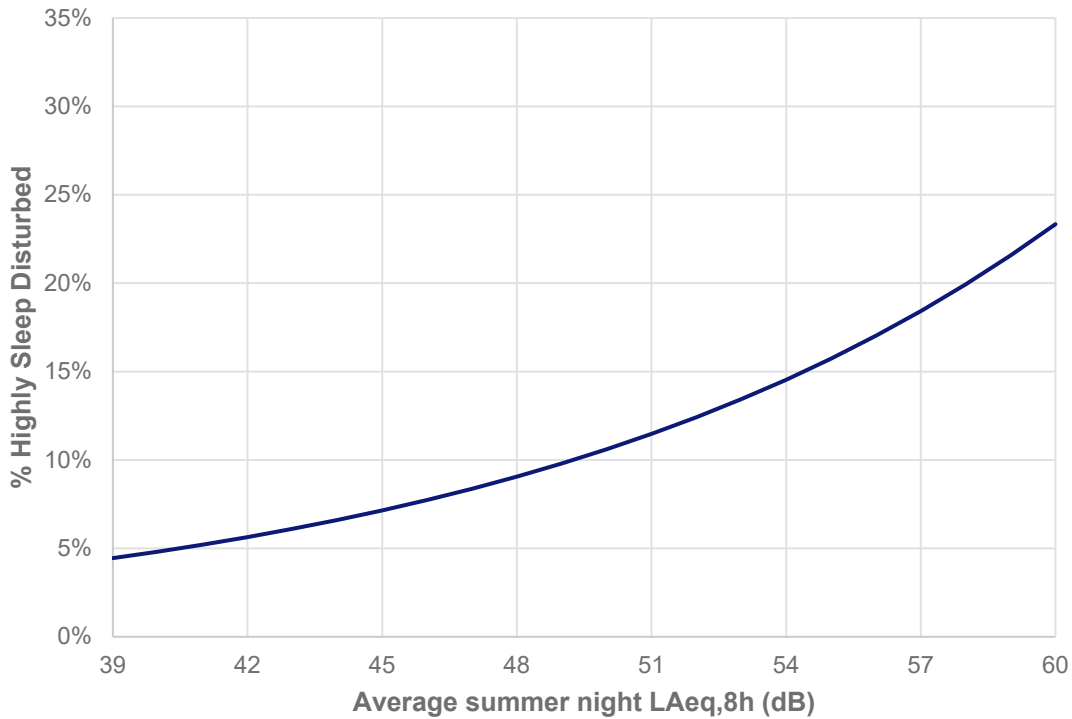

5.39   Logistic regression functions were fitted to the data shown in Figures 4 and 5, the latter was done so that the data may be compared against Miedema's highly sleep disturbed dose response curve that is expressed as function of L_{night}[19]. These are presented in Figures 7 and 8 respectively.

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[18] For the <1 and ≥40 categories, the average noise dose is the average measured noise dose for the respondents in these categories.

[19] EEA Technical report No 11/2010, "Good practice guide on noise exposure and potential health effects", ISSN 1725-2237, European Environment Agency, October 2010.

Figure 7: Logistic regression function for percent highly sleep disturbed for SoNA 2014 night as a function of average summer night $L_{Aeq,8h}$

Figure 8: Logistic regression function for percent highly sleep disturbed for SoNA 2014 night as a function of average annual L_{night} and compared with Miedema pre-1990 and post-1990 studies[7]
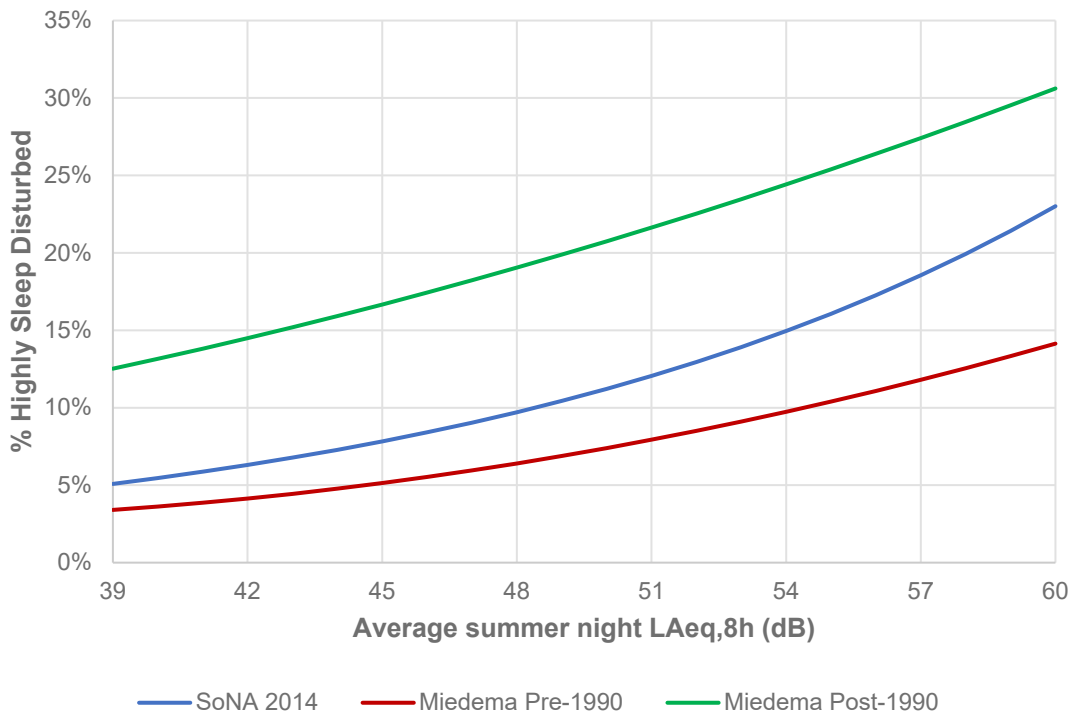
5.40   Response to the SoNA 2014 question leads to a higher dose-response curve for a given night noise exposure level than Miedema pre-1990 studies function, but below the dose-response function for the post-1990 studies.

5.41   The two SoNA 2014 dose response functions in Figures 8 and 9 are:

$$\%HSD = \frac{100}{\left(1 + EXP\left(10.798 - 0.079 \times L_{Aeq,8h}\right)\right)}$$

$$\%HSD = \frac{100}{\left(1 + EXP\left(10.392 - 0.072 \times L_{night}\right)\right)}$$

Chapter 6
Health and Wellbeing

6.1   An objective of the SoNA 2014 survey was also to obtain evidence on the effects of noise on well-being and health. The scope of the well-being and health questions was, however, constrained by the need to limit the length of the questionnaire.

6.2   The questionnaire asked respondents a question about their general health at the time of interview and specific questions using a previously validated well-being scale. Question HL1 asked people to rate their health on a 5-point scale. Over half the respondents stated that their health rating was "very good" or "excellent".

6.3   Having established that average summer night $L_{Aeq,8h}$ noise exposure was correlated with sleep disturbance, this section of the report only assesses health and wellbeing in the context of average summer night $L_{Aeq,8h}$ noise exposure.

6.4   A Chi-Square Test of Independence was performed to examine the relationship between self-reported health ratings and self-reported sleep disturbance score (CAN1vii). There was no significant relationship found between self-reported sleep disturbance and self-reported health rating.

6.5   A Chi-Square Test of Independence was performed to examine the relationship between self-reported health rating and average summer night, $L_{Aeq,8h}$ aircraft noise exposure. The relationship between these variables was not significant ($X^2(16)>=23.09$, $p=0.111$). This test suggests that there is no relationship between self-reported health rating and aircraft night noise exposure level.

6.6   Question HL4 asked respondents to complete the short Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS), which comprises seven questions:

[Show on screen in random order.]	A) All of the time	B) Often	C) Some of the time	D) Rarely	E) None of the time	F) Don't know/ refused
I've been feeling optimistic about the future	○	○	○	○	○	○
I've been feeling useful	○	○	○	○	○	○
I've been feeling relaxed	○	○	○	○	○	○
I've been dealing with problems well	○	○	○	○	○	○
I've been thinking clearly	○	○	○	○	○	○
I've been feeling close to other people	○	○	○	○	○	○
I've been able to make up my own mind about things	○	○	○	○	○	○

6.7   In relation to HL4, 43 of the 1,483 did not answer or refused to answer, therefore their SWEMWBS could not be calculated. Subsequent analysis presented here is with the remaining sample of 1,440 SoNA 2014 night respondents.

6.8   Table 17 shows a crosstabulation table of the calculated SWEMWBS and self-reported sleep disturbance scores (CAN1vii). A Chi-Square Test of Independence was performed to examine the relationship between self-reported mental well-being and sleep disturbance score. The relationship between these variables was found to be significant ($X^2(20)>=185.264$, $p<0.001$). This suggests that there is a relationship between self-reported well-being score and self-reported sleep disturbance score.

Table 17: Crosstabulation results for the Short Warwick-Edinburgh Mental Well-being Score (SWEMWBS) and self-reported sleep disturbance score (5-point ISO scale) (N=1,440)

| SWEMWBS | N | Overall 5-point scale disturbance score | | | | | Total |
		10	30	50	70	90	
< 22	130	8%	7%	15%	10%	12%	9%
22-23	137	7%	12%	14%	13%	7%	10%
24-25	199	13%	16%	18%	17%	4%	14%
26-27	290	20%	18%	16%	26%	24%	20%
28-29	300	21%	19%	22%	20%	23%	21%
30-31	173	14%	12%	9%	4%	12%	12%
>31	211	17%	16%	7%	11%	17%	15%
Total	**1,440**	**52%**	**21%**	**13%**	**9%**	**6%**	**100%**

6.9   Table 18 shows a crosstabulation table of the calculated SWEMWBS and average summer night $L_{Aeq,8h}$. A Chi-Square Test of Independence was performed to examine the relationship between self-reported mental well-being and average summer night noise level. The relationship between these variables was found to be not significant ($X^2(30)>=39.711$, $p=0.111$).

Table 18: Crosstabulation results for the Short Warwick-Edinburgh Mental Well-being Score (SWEMWBS) and average summer night L$_{Aeq,8h}$ (N=1,440)

SWEMWBS	N	Average summer night L$_{Aeq,8h}$						
		<42	<42-44.9	45-47.9	48-50.9	51-53.9	>54	Total
< 22	130	7%	9%	9%	7%	11%	10%	9%
22-23	137	8%	11%	7%	11%	12%	9%	9%
24-25	199	14%	14%	12%	17%	15%	11%	14%
26-27	290	24%	15%	24%	20%	18%	15%	20%
28-29	300	15%	19%	23%	20%	24%	23%	21%
30-31	173	15%	14%	10%	10%	10%	16%	12%
>31	211	17%	18%	14%	15%	10%	15%	15%
Total	**1,440**	**14%**	**17%**	**25%**	**20%**	**13%**	**10%**	**100%**

Chapter 7
Non-acoustic factors

7.1   Chapter 7 of CAP 1506 examined the role that non-acoustic factors play with respect to the likelihood of being highly annoyed. It was intended to use the same approach and examine the role that non-acoustic factors play with respect to the likelihood of being highly sleep disturbed.

7.2   CAP 1506 and this report used a threshold of 72% for being highly annoyed or highly sleep disturbed. For an 11-point scale, this is a score of 8, 9 or 10 and means each individual who answered 8, 9 or 10 is highly annoyed or sleep disturbed and their non-acoustic factors may be examined. For CAP 1506, the 11-point annoyance scale question was CAN34. With respect to sleep disturbance, the 11-point scale question was question CAN7b, however, this cannot be used because it was preceded by a screen questioning, eliminating respondents who said their sleep was disturbed by aircraft noise.

7.3   For a 5-point scale, this is some way along the 4th point (see paragraph 5.31). Thus, although CAN1vii can be used to count the number of respondents highly sleep disturbed, it cannot be used to determine individuals that are highly sleep disturbed and their specific non-acoustic factors for further analysis. Thus, it was not possible to undertake an analysis of non-acoustic with respect to sleep disturbance for this report.

Chapter 8
Summary and Conclusions

Survey and analysis methodology

8.1   An important caveat when taking into account the findings in this report, is that this is supplementary analysis to the original SoNA 2014 study. The SoNA 2014 survey was designed to obtain information on attitudes to daytime annoyance, and as a result, respondents were selected on daytime noise exposure levels. As a result, the findings from this study can only be indicative, rather than conclusive.

8.2   This report assesses attitudes to night-time aircraft noise, using a sample of the SoNA 2014 survey data set. The SoNA 2014 data set contained responses from 1,999 residents around eight airports in England. Respondents were selected using a random, partially-clustered approach. For the purposes of analysing attitudes to night-time aircraft noise, the SoNA 2014 dataset was restricted to respondents from around three airports in England: Gatwick, Heathrow and Stansted, totalling 1,588 participants. 100 of these were not resident during summer 2014, leaving a sample of 1,488, five of which did not answer the night-time annoyance question leaving 1,483 valid responses. Their average summer night $L_{Aeq,8h}$ noise exposure ranged from below 39 dB to greater than 54 dB.

8.3   Unlike for daytime annoyance, there is no standardised question from which to obtain views on self-reported sleep disturbance. Therefore, views were obtained using the standardised annoyance question, 'to what extent are you bothered, disturbed or annoyed' by noise from aeroplanes during the night (11pm-7pm)?'. Responses were recorded on a 5-point categorical scale. A second question asked respondents 'what number from 0 to 10 best shows the degree to which your sleep was disturbed by noise from aeroplanes?'. A third question asked respondents on yes/no basis, whether their sleeping patterns were affected by night-time aircraft noise. However, both of these latter two questions were only asked of a smaller 1,095 sample of the 1,483, since the two questions were preceded by a screening. Analysis of CAN1vii using that sample had a material effect on the overall CAN1vii average night-time disturbance scores. Thus, the analysis in this report was solely based on the 5-point categorical scale question.

8.4   Data transformation to disturbance scores and the threshold for being defined as highly annoyed followed international best practice and the method used in recent UK and overseas studies.

8.5   The analysis aimed to:

- Explore relationships between self-reported sleep disturbance and noise exposure.

- Explore any potential relationship between self-reported sleep disturbance and self-reported quality of health.

8.6   Because it has not been historic practice to obtain evidence on self-reported sleep disturbance, previous studies having instead obtained evidence through objective measures, these findings are exploratory and cannot be compared with any past results.

8.7   It has nevertheless been helpful to recast the objectives into a series of sequential questions, which have been used to frame the following sections.

Is $L_{Aeq,8h}$ an appropriate indicator to use to estimate self-reported sleep disturbance arising from aircraft noise?

8.8   The study compared reported mean night-time disturbance scores against average night noise exposure defined using three different noise indicators: average summer night $L_{Aeq,8h}$, annual average night L_{night}, and average summer night N60.

8.9   All three noise indicators are highly correlated with night-time self-reported sleep disturbance (r^2=0.822-0.883). The r^2 for L_{night} (0.842) was slightly lower than for $L_{Aeq,8h}$ (0.883). It is plausible that L_{night} is inferior to $L_{Aeq,8h}$ as both Gatwick and Stansted airports experience significant seasonality with greater numbers of night flights during the summer months. N60 is found to correlate almost as well as L_{Aeq8h} and L_{night}. Based on this exploratory analysis, there is insufficient evidence to change from the current practice of using average summer night $L_{Aeq,8h}$ noise exposure for UK assessments.

Is summer night, average mode, still the best time period to use as opposed to single-mode?

8.10   There are strong correlations between the night-time disturbance score and noise exposure for all of the temporal modes examined. For CAN1vii the best correlation is with the highest noise level of either westerly or easterly mode. However, it should be noted that all r^2 represent good correlations between mode and rating in these instances, and there is little difference between these correlations. Thus, there is no compelling evidence for a change of practice from using average summer-night. The use of average-summer night also accords with the temporal period used for daytime assessment. However, it is recommended that future studies investigate associations with the highest noise level of either westerly or easterly mode.

How does self-reported sleep disturbance relate to exposure?

8.11   Mean disturbance score and the likelihood of being highly sleep disturbed were found to increase with increasing night-time noise exposure ($L_{Aeq,8h}$). The relationship found was close to linear, though disturbance levels plateau at low and high exposure.

How do the results compare with the Miedema dose-response function?

8.12   For a given noise exposure, a higher proportion of respondents was found to be highly sleep disturbed compared with the Miedema pre-1990 dose-response function. At 45 dB $L_{Aeq,8h}$, 8-10% were estimated to be highly sleep disturbed compared with 5% for the Miedema curve. At 48 dB $L_{Aeq,8h}$, 10-12% were estimated to be highly sleep disturbed compared with 6% for the Miedema curve. The SoNA 2014 night-time dose response function was, however, found to be lower than the function from the post-1990 studies.

How do measures of health and well-being relate to exposure?

8.13   Noise exposure and self-reported sleep disturbance were compared against the self-reported health rating (5-point scale) and the Short Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS), a measure of well-being. Poorer health ratings and lower SWEMWBS scores were found to be associated with sleep disturbance, but not with noise exposure.

Recommendations for future surveys

8.14   Despite the exploratory nature of this analysis, it has been possible to identify some areas where further research would be beneficial, If the objective is to understand better the relationship between night exposure and the effect on sleep, the following recommendations are made:

- Conduct research in the summer so that attitudes and exposure are aligned;

- Respondent selection to take into account night noise exposure levels and, in particular, any dominance of arrival noise at night;

- Adequate sampling to enable further investigation of any association between self-reported night-time disturbance and single-mode $L_{Aeq,8h}$ night exposure.

8.15   Optimising respondent selection to achieve the criteria above will probably mean that it is not possible to investigate daytime annoyance with the same sample.

Appendix A

Glossary of terms

Abbreviations	
ANASE	Attitudes to Noise from Aviation Sources in England (2002 survey reported 2007)
ANIS	Aircraft Noise Index Study (1982 survey reported in 1985)
APF	Aviation Policy Framework
dB	Decibel
dBA	Decibel A-weighted scale
$L_{Aeq,T}$	Equivalent continuous sound level, for period of time, T
$L_{Aeq,8h}$	Equivalent continuous sound level, average summer night 11pm-7am
L_{ASmax}	Maximum single event noise level (time weighted slow)
L_{night}	Equivalent continuous sound level, average annual night 11pm-7am
N	Sample size
N60	Number of events of 60 dB L_{ASmax} or more during an average summer night (11pm-7am)
N70	Number of events of 70 dB L_{ASmax} or more during an average summer night (11pm-7am)
NNAS	National Noise Attitude Survey
OR	Odds ratio
REF	Reference state for the independent variable used in logistic regression
SEL	Sound Exposure Level
SID	Standard Instrument Departure Route
SoNA	Survey of Noise Attitudes
SWEMWBS	Short Warwick-Edinburgh Mental-Wellbeing Score

Appendix B

Survey of Noise Attitudes (SoNA) 2014 Questionnaire

SECTION A

A1. *How long have you lived in this home?*
- ○ Less than 6 months
- ○ 6 months - 1 year
- ○ 1 - 2 years
- ○ 2 - 5 years
- ○ 5 - 10 years
- ○ 10 years or more
- ○ Don't know

{If less than 6 months, ask A1a. Otherwise go to filter before A1b.}
A1a. *How many months is that?*
[Write in. If less than one month, code as 0.]
| {Open text box. Single number allowed, within the range 0-5.} |
{If coded less than "10 years or more" at A1, ask A1b.}
A1b. *And how long have you lived in this area?*
[If asked, "area" can be interpreted as a district, borough or town.]
- ○ Less than 6 months
- ○ 6 months - 1 year
- ○ 1 - 2 years
- ○ 2 - 5 years
- ○ 5 - 10 years
- ○ 10 years or more
- ○ Don't know

A2. [Code type of dwelling, checking with the respondent as necessary.]
- ○ Flat: purpose-built
- ○ Flat: conversion
- ○ Maisonette (flat on two or more floors): purpose-built
- ○ Maisonette (flat on two or more floors): conversion
- ○ Bungalow: detached
- ○ Bungalow: semi-detached (incl. linked semi-detached) / end terrace
- ○ Bungalow: mid-terrace
- ○ House with two or more storeys: detached
- ○ House with two or more storeys: semi-detached (incl. linked semi-detached) / end terrace
- ○ House with two or more storeys: mid-terrace
- ○ Cluster home (a home joined to others at the back as well as the sides(s))
- ○ Other

{If flat/maisonette, ask A2a, else go to A3.}
A2a. [Code: On which floor of the building is the entrance to this particular flat/maisonette? i.e. not the entrance to the building as a whole. Enter number of floor. Enter -1 for basement and 0 for ground floor.]
| {Open text box. Single number allowed, within the range -1 to 50.} |
A2b [Code: What is immediately above the flat or maisonette?
[If the dwelling is a maisonette, this means above the upper storey of the maisonette.]
☐ Flat roof
☐ Loft space (for storage only) and pitched roof
☐ Pitched roof forming the ceiling of a room in the dwelling
☐ One or more other flats/maisonettes

A3. *Do you have use of an outdoor space such as a garden, terrace or balcony here?*
[Includes shared facilities if private.]
☐ Yes – garden
☐ Yes – balcony

o Yes – terrace

☐ No – none§

A3a. *On the whole, how much do you like living in this neighbourhood? Please provide your answer on a scale of 1 to 7, where 1 equals definitely like and 7 equals definitely don't like.*

[Showcard A3a]

○   1   Definitely like

○   2

○   3

○   4

○   5

○   6

○   7   Definitely don't like

○   Don't know

A4. *Is there anything you particularly like about this neighbourhood?*

[Do not read out or show the screen. Try to fit respondent's reply to precodes as much as possible.]

☐ Any mention of quietness / peacefulness / freedom from noises or sources of noise

☐ Any mention of sounds/noises that are liked

☐ Any positive mention of airport, air travel or aircraft

☐ Everything

☐ Any other features that are liked (specify)

{Open text box, text scrolls along if too long for the box.}

☐ Nothing liked§

☐ Don't know§

A5. *Is there anything you particularly dislike about this neighbourhood?*

[Do not read out or show the screen. Try to fit respondent's reply to precodes as much as possible.]

☐ Any mention of disliking aircraft noise

☐ Any mention of disliking other noise (e.g. it's noisy / noise not liked / noise effects / lack of peace & quiet)

☐ Any mention of disliking quietness (or disliking absence of noise/sounds)

☐ Any mention of disliking being close to an airport, without mentioning noise {Go to A5a.}

☐ Potential source of noise [Specify and code below if a potential source of noise.] {Go to A5b.}

☐ Any other features that are disliked [Specify and code below if anything else disliked.]

☐ Nothing disliked§

☐ Don't know§

{Ask A5a and/or A5b as routed from A5. Otherwise skip to A6.}

A5a. *You mentioned that you dislike being close to the airport. What is it in particular that you dislike?*
○   Dislike is wholly or partly about noise
○   Dislike is not about noise

A5b. *You mentioned that you dislike {{from A5: open text}}*
[Read out only the potential source(s) of noise, not anything that is specifically mentioned as a noise, or anything that clearly has nothing to do with noise.]
What is it in particular that you dislike?
○   Dislike is wholly or partly about noise
○   Dislike is not about noise

A6. *This card shows a number of different problems that some people may have with their local environment. Would you please pick up to five that you are personally most affected by?*
[Showcard A6]
☐ Pollution of rivers, lakes, the sea, beaches, etc.
☐ Air pollution from traffic or local industry/agriculture
☐ Loss of natural environment – gardens, green spaces or plant/animal life
☐ Traffic congestion, parking, speed or danger
☐ Extreme weather (e.g. flooding, drought, high winds, snow and ice)
☐ Dust and dirt
☐ Smells
☐ Litter and/or rubbish
☐ Pests, including wild/feral animals, birds, insects or fouling by animals other than dogs
☐ "Light pollution" from streetlights, floodlights, security lights, shops, and other artificial light from outside the home
☐ Fouling by dogs
☐ Noise
☐ None of these[§]

In the rest of the questionnaire I'm going to ask you questions about when you are at home. {If A3 answered "garden, balcony or terrace", say:} *By that, I mean inside your home or outdoors at home, for example {{A3 response}}[20] This applies throughout the remainder of the interview.*

A7a. *Now please think for a moment about all the sounds that come from outside your own home – whether they are sounds that you like or noises that you dislike. Overall, do these sounds make it better or worse to be living here for you personally?*
[If asked, this includes noise from inside neighbours' homes.]
[Showcard A7a]
○   1   Definitely better
○   2
○   3
○   4   Neither better nor worse
○   5
○   6
○   7   Definitely worse
○   Don't know

A7b. *How sensitive would you say you are to noise?*
[Showcard A7b]
○   1   Not at all sensitive
○   2
○   3
○   4
○   5
○   6
○   7   Very sensitive
○   Don't know

---

[20]   Wherever this text insert appears, CAPI inserts "in your garden, on your balcony, on your terrace" or whatever part of this is relevant, given the answer to A3.

A8a. *Thinking about the last 12 months or so, when you are here at home, how much does noise from outside your own home bother, disturb or annoy you?*
[If asked, this includes noise from inside neighbours' homes.]
[Showcard A8a]
○   Not at all
○   Slightly
○   Moderately
○   Very
○   Extremely
○   Don't know
○   Don't hear
{If A8a coded "Not at all" or "Don't know", ask A8a(i). Otherwise go to A8b.}
A8a(i). Is that because you never hear any noise from outside your own home?
○   Never hear noise from outside my home
○   Hear noise from outside my home, but it does not bother, disturb or annoy me at all
○   Don't know
A8b. *Next is a 0-to-10 opinion scale for how much noise from outside your own home bothers, disturbs or annoys you when you are here at home. If you are not at all annoyed choose 0; if you are extremely annoyed choose 10; if you are somewhere in between, choose a number between 0 and 10.*
[If asked, this includes noise from inside neighbours' homes.]
[If respondent states that they do not hear any noise, then code 98, for don't know code 99.]

A8b. *Thinking about the last 12 months or so, what number from 0 to 10 best shows how much you are bothered, disturbed or annoyed by noise from outside your own home?*
[Showcard A8b][21]

0 Not at all	1	2	3	4	5	6	7	8	9	10 Extremely
○	○	○	○	○	○	○	○	○	○	○

○ Don't know ○ Don't hear
{If A8b coded "Not at all or "Don't know", ask A8b(i). Otherwise go to filter after A8b(i).}

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[21]   All columns the same width.

A8b(i). Is that because you never hear any noise from outside your own home?
○   Never hear noise from outside my home
○   Hear noise from outside my home, but it does not bother, disturb or annoy me at all
○   Don't know
{If "Not at all", "Don't hear" or "Don't know" at A8a and 8-10 at A8b
or
"Very" or "Extremely" at A8a and "Not at all", "Don't hear" or "Don't know" at A8b,
new screen and insert instruction:}
[You have coded conflicting responses at A8a and A8b. Please clarify with respondent and recode A8a
and/or A8b if appropriate. Press next to amend or confirm codes.]
*From this point on, I'm going to be asking about sounds and noises only. The next few questions are about
different types of noise. I will show you a few examples of each type of noise that you might have heard, but
by no means do these cover all possibilities, they are examples only.*
[*Allow the respondent a few seconds to look at the picture, before asking the question.*]
A9a. *Thinking about the last 12 months or so, when you are here at home, how much does noise from
aircraft, airports or airfields, bother, disturb or annoy you?*
[Showcards A9a-A9o]
○   Not at all
○   Slightly
○   Moderately
○   Very
○   Extremely
○   Don't know
○   Don't hear
{If A9a coded "Not at all" or "Don't know" ask A10a.}
A10a. Is that because you never hear any noise from aircraft, airports or airfields?
○   Never hear noise from this source
○   Hear noise from this source, but it does not bother, disturb or annoy me at all
○   Don't know

{Repeat A9b-n and (where appropriate) A10b-n for the following noise categories, replacing "*aircraft, airports
or airfields*", in this order and with the relevant show screens.}
A9b. trains or railway stations [Picture Card A9b]
A9c. road traffic [Picture Card A9c]
A9d. sea, river or canal traffic [Picture Card A9d]
A9e. building, construction, demolition, renovation or roadworks [Picture Card A9e]
A9f. neighbours (inside their homes) [Picture Card A9f]
A9g. neighbours (outside their homes) [Picture Card A9g]
A9h. other people nearby [Picture Card A9h]
A9i. sports [Picture Card A9i]
A9j. other entertainment or leisure [Picture Card A9j]
A9k. industrial sites [Picture Card A9k]
A9l. other commercial premises [Picture Card A9l]
A9m.   forestry, farming or agriculture [Picture Card A9m]
A9n. community buildings and spaces [Picture Card A9n]

A9o. *Thinking about the last 12 months or so, when you are here at home, does noise from any other source outside your home bother, disturb or annoy you?*
○ Yes
○ No

{If A9o coded "No" skip to A11.}
 [If respondent does not mention at least one specific source of noise, prompt for one.
Ensure source is external to the respondent's home.
If more than one source is mentioned, ask for the one that most bothers, disturbs or annoys the respondent.
Write in one selected other noise source. Enter source of noise, e.g. "owls", not "noise from owls".]
> {Open text box.}

[Fit to a precoded type if possible, by going back to the relevant A9 question, otherwise maintain "Any other noise" code and tick one box below.]
○ Military activity (other than vehicles on the road or aircraft/airfields)
○ Wild birds
○ Wild animals
○ Weather (e.g. wind, rain, storms)
○ Running water (e.g. rivers, waterfalls) or waves
○ Wind turbines (other than those belonging to a neighbouring home)
○ Other

A11. *I would now like you to think about all these types of noise that I have been asking about. Taking all these noises together, please look at the statements on this card and tell me which one best describes the extent to which noise spoils your home life.*
[Showcard A11]
○ Not at all
○ Not very much
○ A little
○ Quite a lot
○ Totally
○ Don't know

{RTN Section asked if road traffic noise bothers, disturbs or annoys at least "Slightly" (codes 2-5 at A9c).
NN Section asked if noise from neighbours (inside their homes) and/or neighbours (outside their homes) and/or other people nearby bothers, disturbs or annoys at least "Slightly" (codes 2-5 at 9f-h).

[Read out:]
The following questions ask you to reflect over the last year or so about noises you might have heard when you have been here at this home.
{If A3 answered "Yes", say:} *Please remember that when we say "at home", we mean "when you have been at home, either inside your home or {{A3 response}} at home".*

SECTION RTN – ROAD TRAFFIC NOISE
I would now like to ask you some questions specifically about noise from road traffic.
PICTURECARD RTN1
RTN1. *What are the three particular kinds of road traffic noise that most bother, disturb or annoy you?*
So, thinking about these sorts of things...
[Unprompted – code specific noise source – please try to use the precoded list.]
{Allow one to three to be coded.}

☐ No particular noise type[§22]
Traffic Noises
☐ Vehicles starting / stopping / ticking over (at traffic lights, crossings, etc.)
☐ Engine revving
☐ Air brakes
☐ Brake/tyre squeal
☐ Vehicles accelerating / going too fast
☐ Car alarms
☐ Vehicle reversing/turning signals
☐ Noisy exhausts
☐ Loose/faulty parts rattling, whining, etc.
☐ Police / ambulance / fire engine sirens
☐ Noise from irregularities in the road surface – drain covers, traffic calming, cobbles, etc.
☐ Vehicles collecting rubbish, recycling or scrap
☐ Ice cream van chimes
☐ Other music from vehicles
☐ Vehicle horns
☐ Road accidents
☐ Congestion
☐ The background "hum" of road traffic
☐ Informal / illegal motor sports or racing
☐ Pedestrian crossing signals
☐ Any other kind of noise from traffic
   {Open text box, text scrolls along if too long for the box.}
☐ Any other kind of noise from traffic
   {Open text box, text scrolls along if too long for the box.}
☐ Any other kind of noise from traffic
   {Open text box, text scrolls along if too long for the box.}

Noises from types of road
☐ Motorways
☐ Other dual carriageway roads
☐ Single carriageway main roads
☐ Residential/estate roads/country lanes
☐ Car parks
☐ Any other kind of road
   {Open text box, text scrolls along if too long for the box.}
☐ Any other kind of road
   {Open text box, text scrolls along if too long for the box.}

Vehicles
☐ Heavy lorries
☐ Smaller lorries
☐ Delivery vans
☐ Buses / coaches
☐ Private cars / taxis
☐ Motor bikes / scooters
☐ Refuse collection
☐ Electric vehicles
☐ Horse drawn vehicles
☐ Any other kind vehicle
   {Open text box, text scrolls along if too long for the box.}
☐ Any other kind of vehicle
   {Open text box, text scrolls along if too long for the box.}
☐ Any other kind of vehicle
   {Open text box, text scrolls along if too long for the box.}

THERE ARE NO QUESTIONS RTN2 NOR RTN3

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[22]   In effect, this functions as a "Don't know" code in RTN1, NN1 and OSN1.

RTN4. *Does noise from road traffic interfere with any of these aspects of your home life? Please just read out the letters that apply*
[IF YES AT A3 - Showcard RTN4 VERSION 1]
[IF NO AT A3 - Showcard RTN4 VERSION 2]

1	Studying or working at home	O
2	Having a conversation (including on the phone or online[23])	O
3	Quiet leisure activities such as reading, writing or resting	O
4	Listening to TV, radio or music	O
5	Other leisure activities that involve you making a noise such as gaming or making music	O
6	Being able to use every room in the home	O
7	{If yes at A3:}[24] Spending time outdoors at home	O
8	Having the windows or doors open	O
9	Sleeping patterns such as the time you go to bed or get up, or being kept awake	O
	None of these	
	Don't know	

{Go to next noise type. If no others filtered in from A9, go to Section CAN.}

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[23]   Interviewer briefing/notes to say this includes computer-based calls, audio or audio-visual (e.g. Skype) here and for analogous questions in other sections.

[24]   {Shading of the rows skips to the next row if this row is omitted. CAPI did not select garden, balcony or terrace according to answer at A3.}

SECTION NN – NEIGHBOUR NOISE
I would now like to ask you some questions specifically about noise from neighbours and other people when they are nearby.
PICTURECARD NN1
NN1. *What are the three particular kinds of noise from neighbours and other people nearby that most bother, disturb or annoy you?*
So, thinking about these sorts of things...
[Unprompted – code specific noise source – please try to use the precoded list.]
{Allow one to three to be coded.}
☐   No particular noise type§
SUB-HEADING: Noise from inside neighbours' homes
☐   Radio, TV and music (from inside neighbouring homes or outside)
☐   Neighbours' fireworks
☐   Parties (held inside neighbouring homes or outdoors (without fireworks))
☐   Voices / shouting / arguments (from inside other homes or from outside)
☐   Neighbours doing DIY inside (hammering, drilling, etc.)
☐   Alarms (e.g. burglar, fire or smoke)
☐   Phones/mobiles ringing (from inside or outside)*
☐   Dogs (from inside or outside)*
☐   Other domestic animals / pets (from inside or outside)*
☐   Neighbours' footsteps, electric sockets / switches, doors banging, or other banging on walls or floors
☐   Domestic equipment (vacuum cleaners, washing machines, dishwashers, tumble dryers, boilers, etc.)
☐   Any other noise from neighbours inside their homes
   {Open text box, text scrolls along if too long for the box.}

SUB-HEADING: Noise from outside neighbours' homes
☐   Neighbours' wind turbine, air conditioning, generator, heat pump, etc.
☐   Noises from people in neighbouring gardens
   {Open text box, text scrolls along if too long for the box.}
☐   Cutting/pruning/grinding trees in gardens or in the street or communal areas
☐   Neighbours and other people nearby putting out bins or waste for recycling
☐   Neighbours working outside (DIY, gardening, repairing vehicles, etc.)
☐   Waste collection or wheelie bin cleaning services
☐   Other deliveries or collections (e.g. post, supermarkets, mail/online orders)
☐   Neighbours' vehicles (e.g. doors slamming, starting up, driving off)
☐   Any other noise from neighbours outside their homes
   {Open text box, text scrolls along if too long for the box.}

SUB-HEADING: Other noises from people nearby
☐   Any other noise from people nearby who are not neighbours
   {Open text box, text scrolls along if too long for the box.}

{If "Other domestic animals and pets" is one of the chosen options, then clarify by asking NN1a.}

NN1a. *What other type of animal or pet is this?*
[Write in animal types and code below.]

{Open text box, text scrolls along if too long for the box.}

☐ Cat
☐ Cockerel
☐ Other bird
☐ Other type
○ Don't know

{If any chosen option could emanate from either inside the neighbour's house, or outside (marked * at NN1) then clarify by asking NN1b, with as many rows in the response table as are required.}

NN1b. *Were you thinking about noise from inside someone's home or from outside, when you selected …?*
[Read out noise types and code response.]

	Inside	Outside	Both
{{Noise type from NN1}}	○	○	○
{{Noise type from NN1}}	○	○	○

NN4. D*oes noise from neighbours and other people when they are nearby interfere with any of these aspects of your home life? Please just read out the letters that apply.*
[IF YES AT 13 - Showcard NN4 VERSION 1]
[IF NO AT 13 - Showcard NN4 VERSION 2]

1	Studying or working at home	○
2	Having a conversation (including on the phone or online[25])	○
3	Quiet leisure activities such as reading, writing or resting	○
4	Listening to TV, radio or music	○
5	Other leisure activities that involve you making a noise such as gaming or making music	○
6	Being able to use every room in the home	○
7	{If yes at A3:}[26] Spending time outdoors at home	○
8	Having the windows or doors open	○
9	Sleeping patterns such as the time you go to bed or get up, or being kept awake	○
	None of these	○
	Don't know	○

{Go to next noise type. If no others filtered in from A9, go to Section CAN.}

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[25]   Interviewer briefing/notes to say this includes computer-based calls, audio or audio-visual (e.g. Skype) here and for analogous questions in other sections.

[26]   {Shading of the rows skips to the next row if this row is omitted. CAPI did not select garden, balcony or terrace according to answer at A3.}

SECTION CAN – CIVIL AVIATION NOISE[27]
SCREENER IF RESPONDENT HAS LIVED IN HOME FOR LESS THAN 6 MONTHS – CODE 1 AT
QUESTION A1

S1: *Can I just check – have you lived in this home since mid-June 2014?*
Yes – CONTINUE WITH QUESTION PREAMBLE AND FROM CAN1
*No (if no – only the following questions get asked CAN15a, CAN15b, , CAN21a,(and b/c depending on ans
to 21a), CAN22d, CAN23a/b/c/ CAN 22D, CAN26a, b, CAN 28, CAN29, CAN30, 31)*
*PLEASE REFER TO TEXT BEFORE CAN 21 FOR THOSE WHO HAVE RESIDED IN HOME AFTER MID-
JUNE 2014 – THEY WON'T GET THE TEXT BELOW – BUT A VARIANT OF IT.*

*I would now like to ask more about noise specifically from large and small commercial and private
aeroplanes. That means I would like you to ignore any noise you hear from any helicopters or from military
aircraft, for this section of the interview.*
*These questions are also specifically about your experiences during this summer. By summer I mean the
period roughly from mid-June to mid-September 2014.*
{If A3 answered "garden, balcony or terrace", say:} *Also, please remember that when we say "at home", we
mean when you have been at home, either inside your home or {{A3 response}} at home.*
So, to confirm, this is what we are now talking about.
[Showcard CANP]
Response to aircraft noise
CAN1. *So, thinking about this summer, when you were here at home, how much did each of these different
types of noise from aeroplanes bother, disturb or annoy you?*
[Showcard CAN1]

	Not at all	Slightly	Moderately	Very	Extremely	Don't know
Overall noise of all kinds, from aeroplanes	○	○	○	○	○	○
Noise from aeroplanes on the ground at an airport (e.g. taxiing planes, engine testing)	○	○	○	○	○	○
Noise from aeroplanes taking off and climbing	○	○	○	○	○	○
Noise from aeroplanes descending and landing	○	○	○	○	○	○
Noise from aeroplanes in flight	○	○	○	○	○	○
Noise from aeroplanes during the day (7 a.m. - 11 p.m.)	○	○	○	○	○	○
Noise from aeroplanes during the night (11 p.m. - 7 a.m.)	○	○	○	○	○	○

{If "Not at all" or don't know to any item at CAN1 ask CAN1a for each item a not at all or dk response is given
before moving on to the next item.}
CAN1a. *Is that because you did not hear this kind of noise?*
○ I did not hear this kind of noise
○ I did hear this kind of noise but it did not bother, disturb or annoy me at all
○ Don't know

{If CAN1 (iii) and (iv) given an equal rating other than "Not at all" or "Don't know", ask CAN1c before moving
on to the next item.}
CAN1c. *You gave "*descending and landing*" the same rating as "*taking off and climbing*" – is that because
they affect you equally or because you are not sure whether the aeroplanes were arriving or departing?*
○ Affected equally
○ Not sure whether the aeroplanes were arriving or departing
○ Don't know

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[27]   This is the policy topic for 2014 and is more detailed but restricted in scope than Section AN.

{If coded "Not at all", Don't know" or "Don't hear" to all CAN1,ask only CAN 8, CAN15a, CAN15b, 17a/b, can21a-c, 21d and CAN23a, CAN23b, CAN23c, CAN26a, CAN26b, CAN28, CAN29, CAN30, CAN31 AND CAN34 then go to section HL as per specification

THERE IS NO QUESTION CAN 2

CAN3. *Looking at this card, and still thinking about the summer, could you tell me when you were most bothered, disturbed or annoyed, at home, by noise from aeroplanes?*[28]
[If asked, tell respondents they should tick the box if any part of the period applies.]
[Showcard CAN3[29]]

	6 a.m. – 7 a.m.	7 a.m. – 12 noon	12 noon – 7 p.m.	7 p.m. – 11 p.m.	11 p.m. – midnight	midnight – 6 a.m.
Mon-Fri	☐	☐	☐	☐	☐	☐
Sat	☐	☐	☐	☐	☐	☐
Sun	☐	☐	☐	☐	☐	☐

	midnight – 6 a.m.	6 a.m. – 7 a.m.	7 a.m. – 12 noon	12 noon – 7 p.m.	7 p.m. – 11 p.m.	11 p.m. – midnight
Mon-Fri	☐	☐	☐	☐	☐	☐
Sat	☐	☐	☐	☐	☐	☐
Sun	☐	☐	☐	☐	☐	☐

{If CAN3 unanswered, ask CAN3a.}
CAN3a. *Is there definitely no particular time of day or day of the week?*
○   Yes – no particular time/day
○   No – there was a particular time/day [Recode CAN3.] {Go back to CAN3.}
CAN4. *Looking at this card, and thinking about a typical week during the summer, could you tell me any times and days when you do not know about the noise because you were usually not at home then?*
{Show only the periods not coded at CAN3.}
[Showcard CAN3 again][30]
CAN5. H*ow often, on average, were you bothered, disturbed or annoyed by noise from aeroplanes in summer? Was it …*
[Read out and code first to apply.]
○   *Every day*
○   *Most days*
○   *A few days a week*
○   *At least once a week*
○   *At least once a month*
○   *Less often*
○   Don't know
CAN6. *And how often, on average, did you hear noise from aeroplanes in summer? Was it …*
[Read out and code first to apply.]
○   *Every day*
○   *Most days*
○   *A few days a week*
○   *At least once a week*
○   *At least once a month*
○   *Less often*
○   Don't know
{If response to CAN6 is less often than CAN5, ask CAN6a}

---

[28]   The order in which the periods are listed here (and in CAN4) needs to be agreed following the pilot survey, with these two alternatives each being tested in half the sample.

[29]   This showcard will require two versions – one for each version of the question

CAN6a. *I've recorded that you were bothered, disturbed or annoyed {{answer to CAN5}} but that you only heard the noise from aeroplanes {{answer at CAN6}}. Can I just check if that is correct?*
○ Yes correct {continue}
○ No not correct {present the following instruction to interviewers.}
[Either recode CAN6 or go back and recode CAN5.]
CAN7. *Did noise from aeroplanes interfere with any of these aspects of your home life in the summer? Please just read out the letters that apply*
[Showcard CAN7]

		Yes
A	*Studying or working at home*	○
B	*Having a conversation (including on the phone or online[31])*	○
C	*Quiet leisure activities such as reading, writing, resting*	○
D	*Listening to TV, radio or music*	○
E	*Other leisure activities that involve you making a noise such as gaming or making music*	○
F	*Being able to use every room in the home*	○
G	*{If has garden, balcony or terrace at A3} Spending time outdoors at home*	○
H	*Having the windows or doors open*	○
I	*Enjoying the local parks and open spaces*	○
J	*Having friends or family round*	○
K	*Spending time outdoors in the neighbourhood*	○
L	*Sleeping patterns such as the time you go to bed or get up, or being kept awake*	○
	None of these	

{If "Yes" to "Sleeping patterns", ask CAN7a.}
CAN7a. *Over the summer, how often was your sleep affected in some way by noise from aeroplanes? This could include being kept awake or woken up, or changing the times when you go to bed or get up.*
[Read out and code first to apply.]
○ *Every day*
○ *Most days*
○ *A few days a week*
○ *At least once a week*
○ *At least once a month*
○ *Less often*
○ Don't know

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[31] Interviewer briefing/notes to say this includes computer-based calls, audio or audio-visual (e.g. Skype) here and for analogous questions in other sections.

CAN7b. *Thinking about the summer, when you were here at home, what number from 0 to 10 best shows the degree to which your sleep was disturbed by noise from aeroplanes?*
[Showcard CAN7b][32]

0 Not at all disturbed	1	2	3	4	5	6	7	8	9	10 Extremely disturbed
O	O	O	O	O	O	O	O	O	O	O

O   Don't know

CAN8. *Did noise from aeroplanes have any of these effects on your household?*

[Read out]	Yes	No	Not applicable	Don't know
It frightened you	O	O		O
It frightened your children	O	O	O {Skip next item}	O
It woke your children	O	O		O
It bothered, disturbed or annoyed someone else in the household	O	O	O {Skip next item}	O
It woke someone else in the household	O	O		O
It upset or woke your pets	O	O	O	O

THERE IS NO QUESTION CAN 9

{If code 2-5 at CAN1i, ask CAN10. Otherwise go to CAN11a.}
CAN10. *Which one of the following issues, to do with aeroplane noise this summer, concerned you the most? And the next most ...?*
 [Showcard CAN10] . Encourage the respondent to avoid tied ranks but allow if necessary.

	Flights at night (11 p.m. to 7 a.m.)
	Flights during the evening (7 p.m. to 11 p.m.)
	Flights during the day (7 a.m. to 7 p.m.)
	Flights that don't seem to be on the expected flight path
	The number of flights
	The loudness of the aeroplanes
	A lack of quiet between individual flights
	Not knowing when there will be times during the day without aeroplane noise

O   No (other) issues
O   Don't know

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[32]   All columns the same width.

CAN11a. *How much would you say you were bothered, disturbed or annoyed by the noise from aeroplanes this summer, while it was going on?*
[Showcard CAN11a]
○   Not at all
○   Slightly
○   Moderately
○   Very
○   Extremely
○   Don't know
○   Don't hear

CAN11b. *And how much, if at all, do you feel that the noise from aeroplanes spoiled your home life this summer in general, not just when the noise was going on?*
[Showcard CAN11b]
○   Not at all
○   Slightly
○   Moderately
○   Very
○   Extremely
○   Don't know
○   Don't hear
THERE IS NO QUESTION CAN 12
THERE IS NO QUESTION CAN 13
CAN13a. *Thinking about next summer, do you expect that noise from aeroplanes will be more next summer or less?*
[Showcard CAN13a]
○   1   Expect it to be less
○   2
○   3
○   4   Expect it to be roughly the same
○   5
○   6
○   7   Expect it to be more
○   Don't know

THERE IS NO QUESTION CAN 14

Modification of exposure inside the home – behavioural aspects

~CAN15a. *What kind of windows do you have in the room where you sleep?*
[Probe and code all that apply.]

	Single-glazed	Secondary glazed/double glazed or better'	Don't know
Openable	☐	☐	☐
Non-openable	☐	☐	☐

~CAN15b. *What kind of windows do you have in the other room where you spend most time at home?*
[Probe and code all that apply.]

	Single-glazed	Secondary glazed/double glazed or better'	Don't know
Openable	☐	☐	☐
Non-openable	☐	☐	☐

If not lived here since mid-June 2014 – go to CAN21a

THERE IS NO QUESTION CAN16

CAN17a. *Did you ever close the windows, or keep the windows closed, for any of these reasons during the summer?* [If yes, probe to code which reasons.]
[Showcard CAN17a]
☐ Noise from aeroplanes
☐ Other noise coming in through the window
☐ To keep warm or save energy
☐ Other reasons to do with conditions outdoors (e.g. smoke, odours, wind, rain)
☐ Security
☐ Safety (e.g. to prevent children falling out)
☐ To keep pets in
☐ To keep animals/insects/pests out
☐ Habit/preference for no particular reason
☐ Window not openable
☐ Other (please specify)
  {Single-line open text box – text scrolls along if too long for box.}
☐ None of these[§]

CAN17b. *Were there times when you wanted to have a window open anywhere in your home for any of these reasons, but you had it closed to keep out noise from aeroplanes?*
[Showcard CAN17b, probe for which reasons apply.]
Would have liked to have the window open …
☐ To keep cool
☐ To avoid condensation
☐ For fresh air / to prevent odour
☐ To talk to someone or hear what is happening outside
☐ Out of habit or preference for no particular reason
☐ Other (please specify)
  {Single-line open text box – text scrolls along if too long for box.}
☐ No, none of these[§]

CAN18a. *When your windows were closed, were you sometimes still able to hear noise from aeroplanes?*
○   Yes
○   No
○   Don't know

Check on whether summer is the worst time of year

CAN19. *Does noise from aeroplanes bother, disturb or annoy you the same amount all year round or more in certain seasons?*
[Probe as necessary for which seasons.]
☐ Spring
☐ Summer
☐ Autumn
☐ Winter

o All year round – SINGLE CODE ONLY
☐ No particular season – SINGLE CODE ONLY
☐ Don't know§

THERE IS NO QUESTION CAN 20
FOR THOSE NOT RESIDENT SINCE AT LEAST MID-JUNE 2014/THE SUMMER
I would now like to ask you a few questions about noise specifically from large and small commercial and private aeroplanes. That means I would like you to ignore any noise that you hear from any helicopters or from military aircraft, for this section of the interview.
So just to confirm, this is what we are now talking about
SHOWCARD CANP
Actions taken
I would now like you to think about anything else you have done or tried to do about noise from aeroplanes – in general, not just this summer.
This will be modified for those who have not resided in home since mid-June as follows: *I would like you to think about anything you have done or tried to do about noise from aeroplanes in general.*
~CAN21a. *As far as you know, has any work such as this been done on this home, to try to keep noise out?*
[Showcard CAN21a]
☐ Changes to the windows
☐ Changes to the ceiling or roof
☐ Changes to the walls
☐ Mechanical ventilation installed
☐ Any other changes [Write in]
  {Open text box, text scrolls along if too long for the box.}
☐ Don't know§
{If nothing done, skip to CAN22d.}

CAN21b. *Was it done mainly because of noise from aeroplanes, mainly because of some other noise or mainly for some other reason?*
○   Noise from aeroplanes
○   Other noise
○   Other reason [Write in]

{Open text box, text scrolls along if too long for the box.}

○   Don't know
~CAN21c. *And how was the work paid for?*
[Showcard CAN21c]
☐ Done before you moved in
☐ Paid for by you or someone else in your household
☐ Paid for by an airport
☐ Paid for by central Government or local authority (Council)
☐ Paid for by someone else [Write in]

{Open text box, text scrolls along if too long for the box.}

☐ Don't know§
{If only "Done before you moved in" coded, go to filter before CAN22.}
CAN21d. *And when was the work done?*
[Showcard CAN21d]
☐ Since this summer
☐ During this summer
☐ Before this summer
☐ Don't know§

~CAN22d. *Have you or anyone in your household done any of the things on this card about noise from aeroplanes (remembering that this does not include helicopters or military aircraft), whilst living in this home, within the last five years?*
[Showcard CAN22d]

○   Yes (Go to CAN23a)
○   No (Go to CAN26a)
○   Don't know (Go to CAN26a)
~CAN23a. *And was it about noise in the summer, other times of year, or both?*
○   Summer
○   Other times of year
○   Both
○   Don't know

~CAN23b. *Which of these things on this card have you or anyone else in your household done about the noise from aeroplanes within the last five years?*
[Showcard CAN23b]
☐ Made our own noise (e.g. playing music) so that we could not hear the noise from elsewhere
☐ Used earplugs or headphones to avoid hearing the noise
☐ Started, signed or participated in a campaign, protest or petition
☐ Took advice, e.g. from Citizens Advice Bureau, another advice or legal organisation
☐ Went on holiday
☐ Went to somewhere quiet outdoors in the area (e.g. a park, open space or country area)
☐ Went to somewhere quiet outdoors away from the area (e.g. a park, open space or country area)
☐ Went to another town
☐ Used a different room at home
☐ Went to someone else's home
☐ Went to somewhere else indoors (e.g. a library or place of worship)

Complained/wrote/spoke to:
☐ an airport, airport owner or airport operator
☐ one or more airlines
☐ the Civil Aviation Authority
☐ a newspaper or TV/radio station
☐ a resident's association
☐ the Environmental Health Department in the Local Authority (Council)
☐ another Local Authority (Council) Department
☐ a Government Department
☐ the Police
☐ a Councillor
☐ a Member of Parliament[33]
☐ someone else, (please specify)
> {Open text box, text scrolls along if too long for the box.}
☐ Did something else to stop the noise being made or heard (please specify)
> {Open text box, text scrolls along if too long for the box.}
☐ Exactly the same action taken as reported earlier {skip to CAN24}
☐ Don't know
~CAN23c. *Was the issue resolved to your satisfaction when you {{Action from CAN23b}}, only partially or not at all?*
[If multiple action of the same kind about exactly the same issue, code final outcome.]
○ Yes
○ Partially
○ Not at all
○ Don't know
Confounding factors
~CAN26a. *Have you taken any flights from any UK airport, for either work or leisure, in the past five years?*
[If yes, probe for how often.]
○   Yes, more than once a year
○   Yes, but only about once a year or less
○   No, not at all
○   Don't remember
{If Yes, ask CAN26b. Otherwise go to CAN28}.
~CAN26b. *Have you used [INSERT NAME OF AIRPORT FROM SAMPLE] Airport for either work or leisure flights in the past five years?*
[If yes, and if "more than once a year" at CAN26a, probe for how often.]
○   Yes, more than once a year
○   Yes, but only about once a year or less
○   No, not at all
○   Don't remember

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[33]   If respondent asks, this includes UK Parliament, European Parliament and Scottish, Welsh or Northern Irish devolved government.

CAN28. *Are you aware of any of the following?*
[Read out]
☐ *[INSERT NAME OF AIRPORT FROM SAMPLE] Airport Consultative Committee*
☐ *[INSERT NAME OF AIRPORT FROM SAMPLE] Airport Noise Action Plan*
☐ *[INSERT NAME OF AIRPORT FROM SAMPLE] Airport Master Plan*
☐ *[INSERT NAME OF AIRPORT FROM SAMPLE] Airport website information on noise*
☐ Any *[INSERT NAME OF AIRPORT FROM SAMPLE] Airport schemes that provide direct benefits to residents, for example for sound insulation, relocation or noise compensation*
☐ *None of these*[§]
~CAN29. *Are you aware of any attempts by [INSERT NAME OF AIRPORT FROM SAMPLE] Airport or the airlines to improve control of the noise from aeroplanes?*
○ Yes [Prompt and write in.]

| {Open text box. "Return" key can be used within the box.}. |

○ No
~CAN30. *Are you aware of anything that [INSERT NAME OF AIRPORT FROM SAMPLE] Airport has sponsored or supported in the local community?*
○ Yes [Prompt and write in.]

| {Open text box. "Return" key can be used within the box.}. |

○ No

~CAN31 *To what extent do you agree or disagree with the following statements?*
[Showcard CAN31]

INTERVIEWER NOTE: THESE WILL BE IN A DIFFERENT ORDER EACH TIME – THE INTERVIEWER READS OUT THE OPTIONS, AND THE RESPONDENT WILL ANSWER FROM STRONGLY AGREE TO STRONGLY DISAGREE	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
Noise from aeroplanes is bad for the health of myself or my household	O	O	O	O	O
Noise from aeroplanes is bad for children's education at the local schools	O	O	O	O	O
Aeroplanes cause air pollution around here	O	O	O	O	O
Having an airport in the area is good for the local economy	O	O	O	O	O
I worry about plane crashes around here	O	O	O	O	O
Noise from aeroplanes makes my home less valuable	O	O	O	O	O
Having an airport in the area makes my home more valuable	O	O	O	O	O
It is convenient to have an airport in the area	O	O	O	O	O
Air travel harms the environment	O	O	O	O	O
I like flying	O	O	O	O	O
I worry about more land being taken over by the airport	O	O	O	O	O
I like watching the aeroplanes	O	O	O	O	O

Final ratings

ASK IF LIVED AT HOME SINCE MID-JUNE 2014.

CAN32. *Thinking again about just this summer – so from mid-June to mid-September – how much did noise from aeroplanes bother, disturb or annoy you in each of these locations?*
[Showcard CAN32]

	Not at all	Slightly	Moderately	Very	Extremely	Don't know	Don't hear
Noise from aeroplanes while indoors at home	O	O	O	O	O	O	O
{If "Yes" at A3:} Noise from aeroplanes while outdoors at home	O	O	O	O	O	O	O
Noise from aeroplanes while outdoors around the neighbourhood	O	O	O	O	O	O	O
Overall noise from aeroplanes at home and around the neighbourhood.	O	O	O	O	O	O	O

{If "Not at all" or "Don't know" to any item at CAN32, ask CAN32a before moving on to the next item.}

CAN32a. *Is that because you did not hear this kind of noise?*
○ I did not hear this kind of noise
○ I did hear this kind of noise but it did not bother, disturb or annoy me at all
○ Don't know

To sum up your answers, I would like you to use a 0-to-10 opinion scale for how much noise from aeroplanes bothered, disturbed or annoyed you when you were here at home this summer. If you were not at all annoyed, choose 0; if you were extremely annoyed, choose 10; if you were somewhere in between, choose a number between 0 and 10.
[If respondent states that they do not hear any noise, then code 98, for don't know code 99.]

THERE IS NO QUESTION CAN 33
CAN34. *Thinking about this summer, what number from 0 to 10 best shows how much you were bothered, disturbed or annoyed by noise from aeroplanes?*
[Showcard CAN34][34]

0 Not at all	1	2	3	4	5	6	7	8	9	10 Extremely
○	○	○	○	○	○	○	○	○	○	○

○ Don't know   ○ Don't hear

SECTION HL – INDIVIDUAL HEALTH
I would now like to ask you a few questions about your health today.
HL1. *In general, would you say your health is:*
[Showcard HL1]
○ Excellent
○ Very good
○ Good
○ Fair
○ Poor
○ Don't know

HL2. *Do you often feel tired and not rested in the morning?*
○ Yes
○ No

HL3. *During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep because of noise?*
[Showcard HL3]
○ Not during the past month
○ Less than once a week
○ Once or twice a week
○ Three or more times a week
○ Would rather not say

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[34] All columns the same width.

HL4. *I'm going to read out some statements about feelings and thoughts. For each one, please tell me how often, if at all, you have felt this way over the last two weeks. Please read out the letter that applies?*
[Showcard HL4]

[Show on screen in random order.]	A) All of the time	B) Often	C) Some of the time	D) Rarely	E) None of the time	F) Don't know/ refused
I've been feeling optimistic about the future	O	O	O	O	O	O
I've been feeling useful	O	O	O	O	O	O
I've been feeling relaxed	O	O	O	O	O	O
I've been dealing with problems well	O	O	O	O	O	O
I've been thinking clearly	O	O	O	O	O	O
I've been feeling close to other people	O	O	O	O	O	O
I've been able to make up my own mind about things	O	O	O	O	O	O

Source: Warwick–Edinburgh Mental Well-being Scale (WEMWBS)

SECTION H – HOUSEHOLD INFORMATION
I would like to finish by asking you a few questions about this home and your household.
SoNA2013 items
H2. *In what year was your home originally built?*
[Prompt if necessary.]
O   Before 1919
O   1919 – 1940
O   1941 – 1960
O   1961 – 1990
O   1991 – 2000
O   2001 – 2010
O   2011 – 2014
O   Don't know
H3. *Which of these applies to your home?*
[Showcard H3]
O   Being bought on a mortgage
O   Owned outright by household
O   Rented from local authority
O   Rented from housing association
O   Rented from private landlord
O   Shared ownership
O   Tied to employment
O   Other
O   Refused

H4a. *How did you come to be living here?*
[Showcard H4a]
○ My choice
○ Choice made with someone else in the household
○ Choice made by someone else in the household
○ Choice made by landlord (e.g. Local Authority, housing association)
○ Choice made by someone else outside the household, e.g. employer
○ Other (please specify)
| {Open text box. "Return" key can be used within the box.} |
Refused§

H4a(ii). *Prior to moving here, were you aware of a possibility of hearing noise from the airport?*
[Showcard H4a(ii)]
○ I have always lived here
○ No
○ Yes, but the noise was more than I expected
○ Yes, and the noise was roughly what I expected
○ Yes, but the noise was less than I expected
○ Yes, but the noise has got worse since I moved here
Don't know
Refused

H4b. *Which (if any) of these things do you not like about living in this home?*
[Showcard H4b]
☐ Not knowing the neighbourhood
☐ Being far from family/friends
☐ Being far from work
☐ Being far from your own community
☐ The neighbours
☐ Crime/violence/gangs/youths/drug dealers
☐ The local schools
☐ The transport links
☐ Lack of parks, lakes, countryside or other open spaces
☐ The shops
☐ Not enough parking
☐ Other local facilities
☐ Dog fouling
☐ Traffic/roads/close to roads
☐ Litter
☐ Generally dislike the neighbourhood
☐ None of these§

H4c. *And which (if any) of these things do you see as good things about living in this home?*
[Showcard H4c]
☐ Born in this neighbourhood
☐ Being near family/friends
☐ Being near work
☐ Being near your own community
☐ Friendly area/good neighbours/community spirit
☐ Safety/low crime
☐ The local schools
☐ The transport links
☐ Parks, lakes, countryside or other open spaces
☐ The shops
☐ Other local facilities
☐ Generally clean and tidy
☐ Generally like the neighbourhood
☐ None of these§

H5. *Which of these age groups are you in?*
[Showcard H5]
○ 18 – 19 years
○ 20 – 24 years
○ 25 – 34 years

¡   35 – 44 years
○   45 – 54 years
○   55 – 64 years
○   65 – 74 years
○   75 years or older
○   Refused

H6. [Code respondent gender.]
○   Male
○   Female

H7a. *Please tell me if you have other household members in the following age categories?*
[Showcard H7a]
☐ Under 1
☐ 1-4 years
☐ 5-10 years
☐ 11-15 years
☐ 16-17 years
☐ 18-19 years
☐ 20-24 years
☐ 25-34 years
☐ 35-44 years
☐ 45-54 years
☐ 55-64 years
☐ 65-74 years
☐ 75 years or older
☐ None§
☐ Refused§

{If any coded at H7a, ask H7b.}
H7b. *How many people in each age group, other than yourself, live in this household?*
[Probe for each displayed age group.]

	1	2	3	4	5	6	7	8	9	10+
{{Age group}}	○	○	○	○	○	○	○	○	○	○

○ Refused§

H8. *Which of these best describes your current situation?*
[Showcard H8]
○   Working full time (30 hours a week or more)
○   Working part time
○   Unemployed and looking for work
○   Retired from paid work altogether
○   In full-time education
○   Looking after the home or family
○   Something else
○   Refused

{If working full or part time, ask H9a. Otherwise go to filter before H10a.}
H9a. *Do you ever work from home?*
○   Yes
○   No

{If "Yes" at H9a, ask H9b. Otherwise go to H9c.}
H9b. *How many days in a typical week do you work from home?*
○   Less than 3
○   3 to 4
○   5 to 7
○   Varies
○   Don't know

H9c. *Which of the following times of day do you normally work?*
[Showcard H9c]
○   Mostly during the day
○   Mostly in the evenings
○   Mostly at night

¡   Varying shift patterns
○   Don't know

Airport-related employment
{If working, ask H10a.}
H10a. *Does your work include any of these kinds of employment?*
[Showcard H10a]
☐ Working for an airport
☐ Working for an airline
☐ Working for another company that does business at an airport
☐ Work that is not at an airport but gets some benefit from the airport being there
☐ Other work related to the aircraft or air travel industry.
☐ None of these§
{If retired, ask H10b.}
H10b *Did your work, before you retired, include any of these kinds of employment?*
[Showcard H10b]
☐ Working for an airport
☐ Working for an airline
☐ Working for another company that does business at an airport
☐ Work that is not at an airport but gets some benefit from the airport being there
☐ Other work related to the aircraft or air travel industry.
☐ None of these§
{If anyone else aged 16+ in the household at H7a, ask H10c.}
H10c *Does anyone else in the household have work that includes any of these kinds of employment?*
[Showcard H10c]
☐ Working for an airport
☐ Working for an airline
☐ Working for another company that does business at an airport
☐ Work that is not at an airport but gets some benefit from the airport being there
☐ Other work related to the aircraft or air travel industry.
☐ None of these§
SoNA2013 items
ASK ALL

ALL QUESTIONS BELOW BASED ON CIE, WHETHER RESPONDENT OR ANOTHER MEMBER OF HOUSEHOLD.
IF THE CIE IS RETIRED AND RECEIVES A PENSION FROM THEIR LAST COMPANY, QUESTIONS SHOULD BE BASED ON THEIR POSITION WHILST WORKING AT THE COMPANY
IF THE CIE IS A WIDOW/WIDOWER AND THEIR LARGEST SOURCE OF INCOME IS A PENSION FROM THEIR PARTNERS LAST COMPANY, QUESTIONS SHOULD BE BASED ON THEIR PARTNERS POSITION WHILST WORKING AT THE COMPANY
NOW COLLECT DETAILS OF RESPONDENT'S JOB .
THE CHIEF INCOME EARNER IS :
THERE IS NO QUESTION H11

H12a. *What type of firm do you work for?*

| {Open text box, text scrolls along if too long for the box.} |
○   Refused
H12b. *What do you do? What does the work involve?*

| {Open text box, text scrolls along if too long for the box.} |
○   Refused
H12c. *Is the work manual/non manual?*
○   Manual
○   Non manual
○   Refused

H12d. *Are you an employee or self employed?*
○   Employed

¡   Self employed
O   Refused

H12e. *Do you have any position/rank/grade in the organisation? (PROMPT: Foreman, Sergeant, Manager, Chief Executive etc.)*

{Open text box, text scrolls along if too long for the box.}

O   Refused

H12f. *How many people work at the same place?*

{Allow numerals only}

O   Refused

H12g. *How many people are you responsible for?*

{Allow numerals only}

O   Refused

H12h. [Type in any other relevant information regarding people they are responsible for.]
(E.G. OTHER SALESMEN, MANAGERS, CLERICAL OR MANUAL WORKERS)

{Open text box, text scrolls along if too long for the box.}

O   Refused

H12i. *What is the job title of the person you report to?*

{Open text box, text scrolls along if too long for the box.}	{Allow numerals only}

O   Refused

H12i. *What qualifications do you have that are relevant to your job?*
[COLLECT ALL AND PROBE FOR LEVEL E.G. BELOW, AT, ABOVE DEGREE LEVEL]1

{Open text box, text scrolls along if too long for the box.}	{Allow numerals only}

O   Refused

H13. *Occupation of Chief Income Earner*
{SUMMARISE RESPONSES TO H12 IN BOX BELOW}

Type of firm:	
Job:	
Employment status:	
No. of people at place of work:	
No. of people responsible for:	
Qualifications:	
Position/rank/grade:	
Report to:	

[CIE/Respondent is in group ...][35]
O   A
O   B
O   C1
O   C2
O   D
O   E

H14a. *The Department for the Environment, Food and Rural Affairs (Defra) and the Department for Transport (DfT) would like to combine the answers you have given with other information on local noise and noise sources. To do this they would need to know your full address, and I need to ask your permission for us to include your address with the survey data.*
I can guarantee that your address will only be used by Defra and DfT and people working on behalf of Defra and DfT, and will only be used to combine your answers with information about noise. Is it OK to include your address with the survey data or would you prefer not?
O   Yes – can include address
O   No – would prefer not

H14b. *There are no plans at present for any follow-up interview to this survey, but if there were in future would you be prepared to take part in further research on similar topics for Defra or DfT?*
Your address details may be passed on to Defra and/ or DfT to be used by either themselves or another research organisation – they will only be used for research purposes
O   Yes – prepared to take part
O   No – would prefer not

H15a. [Record: Is the respondent address exactly as given in the Contact Sheet?]
O   Yes {Ask H15b.}
O No {Skip to H15c.}

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[35] Standard social group classification.

H15b. [Enter name, address and telephone details, explain to respondent that we ask for phone number so that a certain percentage of interviews can be checked – explain that if they do not want to be called for further research by {{fieldwork contractor}} this number will not be passed on to other {{fieldwork contractor}} researchers. Ensure you write in the full address and postcode (this is on your sample list).]

Title:	{Drop-down: Mr / Mrs / Miss / Ms}
Name:	{Open text box}
Phone number:	{0nnnn nnnnnn required} [Enter 01, 02 or 03 for a landline, 07 for a mobile then 3 further digits, a space and the rest of the phone number, e.g. 02072 890901.]
Phone type:	{Drop-down: Home / Mobile / Ex-directory / Refused}

{Go to H16.}

H15c. [Enter name and telephone details, explain to respondent that we ask for phone number so that a certain percentage of interviews can be checked – explain that if they do not want to be called for further research by {{fieldwork contractor}} this number will not be passed on to other {{fieldwork contractor}} researchers.]

Title:	{Drop-down: Mr / Mrs / Miss / Ms}
Name:	{Open text box}
Phone number:	{0nnnn nnnnnn required} [Enter 01, 02 or 03 for a landline, 07 for a mobile then 3 further digits, a space and the rest of the phone number, e.g. 02072 890901.]
Phone type:	{Drop-down: Home / Mobile / Ex-directory / Refused}

H16. *If we needed to check anything about any of your answers would it be all right if we contacted you again?*

O   Yes
O   No