Office for National Statistics

General Household Survey 2007

Sampling Errors

Appendix C

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Tables in this appendix present estimates of sampling errors for some of the main variables used in this report, taking into account the complex sample design of the survey.

Sources of error in surveys

Survey results are subject to various sources of error. The total error in a survey estimate is the difference between the estimate derived from the sample data collected and the true value for the population. The total error is made up of two main types: systematic and random error.

Systematic error

Systematic error occurs when data are consistently biased in a certain way, such that the variation from the true values for the population will not average to zero over repeats of the survey. For example, if a certain section of the population is excluded from the sampling frame, estimates may be biased because non-respondents to the survey have different characteristics to respondents. Another cause of bias may be that interviewers systematically influence responses in one way or another. Substantial efforts have been made to avoid systematic errors, for example, through extensive interviewer training and by weighting the data collected for non-response.

Random error

Random error, or bias, is the variation in sample data from the true values for the population, which occurs by chance. This type of error is expected to average to zero over a number of repeats of the survey. Random error may result from sources such as variation in respondents' interpretation of the survey questions, or interviewer variation. Efforts are made to minimise these effects through pilot work and consistent interviewer training.

Sampling errors

An important component of random error is sampling error, which arises because the variable estimates are based on a sample rather than a full census of the population. The results obtained for any single sample would be likely to vary slightly from the true values for the population. The difference between the estimates derived from the sample and the true population values is referred to as the sampling error. The amount of variation can generally be reduced by increasing the size of the sample, and by improving the sample design. Sampling errors have been measured for estimates derived from the General Household Survey (GHS), and these may be used to assess the accuracy of the estimates presented in this report.

Calculating standard errors

Unlike non-sampling errors, it is possible to estimate the size of sampling error, by calculating the standard error of the survey estimates. The standard error (se) of a percentage p, based on a simple random sample of size n is calculated by the formula,

$$se(p)_{srs}=\sqrt{(p(100-p)/n)}.$$

The GHS uses a multi-stage sample design, which involves both clustering and stratification (see Appendix B). The complexity of the design means that sampling errors calculated on the basis of a simple random sample design will not reflect the true variance in the survey estimates. Clustering can lead to a substantial increase in sampling error if the households or individuals within the primary sampling units (PSUs) are relatively homogenous but the PSUs differ from one another. By contrast, stratification tends to reduce sampling error and is particularly effective when the stratification factor is related to the characteristics of interest on the survey.

Because of the complexity of the GHS sample design, the size of the standard error depends on how the characteristic of interest is spread within and between the PSUs and strata. The method used to calculate the standard errors for the survey takes this into account. It explicitly allows for the fact that the estimated values (percentages and means) are ratios of two survey estimates: the number with the characteristic of interest is the numerator (y) and the sample size is the denominator (x), both of which are subject to random error.

The standard error of a survey estimate is found by calculating the positive square root of the estimated variance of the ratio. The formula used to estimate the variance of a ratio estimator r (where $r = y/x$) is shown below.

$$var(r) = \frac{1}{x^2}[var(y) + r^2 var(x) - 2r\, cov(y,x)]$$

$Var(r)$ is the estimate of the variance of the ratio, r, expressed in terms of $var(y)$ and $var(x)$ which are the estimated variances of y and x, and $cov(y,x)$ which is their estimated covariance. The resulting estimate is only valid if the denominator (x) does not vary too greatly. The method compares the differences between totals for adjacent PSUs (postal sectors) in the characteristic of interest. The ordering of PSUs reflects the ranking of postal sectors on the stratifiers used in the sample design.

Design factors

The design factor, or deft, of an estimate p is the ratio of the complex standard error of p *to* the standard error of p that would have resulted had the survey design been a simple random sample of the same size.

$$deft(p) = \frac{se(p)}{se_{srs}(p)}$$

This is often used to give a broad indication of the effect of the clustering on the reliability of estimates. The size of the design factor varies between survey variables reflecting the degree to which a characteristic of interest is clustered within PSUs, or is distributed

between strata. For a single variable the size of the design factor also varies according to the size of the subgroup on which the estimate is based, and on the distribution of that subgroup between PSUs and strata. Design factors below 1.0 show that the complex sample design improved on the estimate that we would have expected from a simple random sample, probably due to the benefits of stratification. Design factors greater than 1.0 show less reliable estimates than might be gained from a simple random sample, due to the effects of clustering. Design factors equal to 1.0 indicate no difference in the survey design on the reliability of the estimate.

The formula to calculate the standard error of the difference between two percentages for a complex sample design is:

$$se(p_1-p_2)=\sqrt{[deft^2_1(p_1(100-p_1)/n_1)+ deft^2_2 (p_2(100-p_2)/n_2)]}.$$

where p_1 and p_2 are observed percentages for the two sub-samples and n_1 and n_2 are the sub-sample sizes.

Confidence intervals

The estimate produced from a sample survey will rarely be identical to the population value, but statistical theory allows us to measure its accuracy. A confidence interval can be calculated around the estimated value, which gives a range in which the true value for the population is likely to fall. The standard error measures the precision with which the estimates from the sample approximate to the true population values and is used to construct the confidence interval for each survey estimate.

The 95% confidence intervals have been calculated for each estimated value presented. These are known as such, because if it were possible to repeat the survey under the same conditions a number of times, we would expect 95% of the confidence intervals calculated in this way to contain the true population value for that estimate. When assessing the results of a single survey, it is usual to assume that there is only a 5% chance that the true population value falls outside the 95% confidence interval calculated for each survey estimate. To construct the bounds of the confidence interval, 1.96 times the standard error is subtracted from, and added to, the estimated value, since under a normal distribution, 95% of values lie within 1.96 standard errors of the mean value. The confidence interval is then given by:

$$p \pm 1.96 \times se(p).$$

The 95% confidence interval for the difference between two percentages is given by:

$$(p_1-p_2) \pm 1.96 \times se\,(p_1-p_2).$$

If this confidence interval includes zero then the observed difference is considered to be a result of chance variation in the sample. If the interval does not include zero then it is unlikely (less than 5% probability) that the observed difference could have occurred by chance.

Standard errors for the 2007 GHS

The standard errors were calculated on weighted data using STATA[1]. Weighting for different sampling probabilities results in larger sampling errors than for an equal-probability sample without weights. However, weighting which uses population totals to control for differential non-response tends to lead to a reduction in the errors. The method used to calculate the sampling errors correctly allows for the inflation in the sampling errors caused by the first type of weighting but, in treating the second type of weighting in the same way as the first, incorrectly inflates the estimates further. Therefore the standard errors and defts presented are likely to be slight over-estimates. Weighted data were used so that the values of the percentages and means were the same as those in the substantive chapters of the report.

Tables C.1 to C.12 show the standard error, the 95% confidence interval and the deft for selected survey estimates. The tables do not cover all the topics discussed in the report but show a selection of estimates.

For the design factors of household based estimates, 7% were below 1.1, more than a third (37%) were less than 1.2, and two thirds (67%) of the defts were less than 1.3. There were four cases (13% of the household-based estimates) where the deft was 1.5 or greater. The higher defts were mostly for tenure and accommodation type (Table C.1) where the effects of clustering lead to a loss of precision compared with that of a simple random sample.

For the design factors of person based estimates, 4% were below 1, 14% were below 1.1, nearly two fifths (37%) were less than 1.2, and nearly two thirds (65%) of the defts were less than 1.3. Nine per cent of the defts were 1.5 or greater, including many of those for estimates of ethnicity, shown in Table C.6. As well as clustering in the same sectors, people from the same ethnic backgrounds will generally cluster within the same households, and so estimates have high sampling errors and high defts. In contrast, estimates broken down by gender will generally have lower sampling errors because there is often one man and one woman in a household; for example, the estimates of males and females in the population have defts of 0.8 (Table C.4).

Estimating standard errors for other survey measures

The standard errors of survey measures, which are not presented in the tables and for sample subgroups may be estimated by applying an appropriate value of deft to the sampling error. The choice of an appropriate value of deft will vary according to whether the basic survey measure is included in the tables. Since most deft values are relatively small (1.3 or less) the absolute effect of adjusting sampling errors to take account of the survey's complex design will be small. In most cases it will result in an increase of less than 30% over the standard error assuming a simple random sample. Whether it is considered necessary to use deft or to use the basic estimates of standard errors assuming a simple random sample is a matter of judgement and depends chiefly on the use to which the survey results are to be put.

Sampling Errors

Significance of year on year changes

In 2005, the GHS adopted a new sample design in line with European requirements, changing from a cross-sectional to a longitudinal format (see Appendix B for details). Therefore, when looking to see if a year on year change is significant you need to take account of the fact that the samples are not independent ie a proportion of the people interviewed the previous year will be re-interviewed in the current year. As stated above, the 95% confidence interval for the difference between two percentages is given by:

$$(p_t - p_{t-1}) \pm 1.96 \times se\,(p_t - p_{t-1}).$$

And if this confidence interval includes zero then the observed difference is considered to be a result of chance variation in the sample. If the interval does not include zero then it is unlikely (less than 5% probability) that the observed difference could have occurred by chance. However, where the samples are not independent, the variance for the estimate of change, $p_t - p_{t-1}$, includes an additional term to take account of the correlation, giving:

$$se\,(p_t - p_{t-1}) = \sqrt{[\,\mathrm{var}(p_t) + \mathrm{var}(p_{t-1}) - 2\,\mathrm{cov}(p_t, p_{t-1})]}$$

Because the covariance cannot be calculated from the data provided, we have provided the complete standard errors of change for $p_t - p_{t-1}$ for some key estimates. These can be found in tables C5a, C9a, C10a and C11a.

Where significance tests are required for other estimates, assuming independent samples would be a suitable conservative approach. That is to say any significant change found using this method would still be significant taking the overlap into account.

Notes and references

1. STATA is a statistical analysis software package. For further details of the method of calculation see: Elliot D. A comparison of software for producing sampling errors on social surveys. *SSD Survey Methodology Bulletin* 1999; **44**: 27-36.

Table C.1 Standard errors and 95% confidence intervals for household tenure, household type and accommodation type

Base	Characteristic	%(*p*)	Unweighted sample size	Standard error of *p*	95% confidence intervals	Deft
All households						
	Household type					
	1 adult aged 16-59	14.2	9,091	0.48	13.3 - 15.1	1.3
	2 adults aged 16-59	15.3	9,091	0.44	14.4 - 16.2	1.2
	Youngest person aged 0-4	11.3	9,091	0.38	10.6 - 12.0	1.1
	Youngest person aged 5-15	15.4	9,091	0.43	14.6 - 16.2	1.1
	3 or more adults	11.8	9,091	0.42	11.0 - 12.6	1.2
	2 adults, 1 or both aged 60 or over	15.8	9,091	0.40	15.0 - 16.6	1.0
	1 adult aged 60 or over	16.2	9,091	0.41	15.4 - 17.0	1.1
	Tenure					
	Owner occupied, owned outright	31.3	9,091	0.60	30.1 - 32.5	1.2
	Owner occupied, with mortgage	40.4	9,091	0.62	39.2 - 41.6	1.2
	Rented from council	10.9	9,091	0.48	10.0 - 11.8	1.5
	Rented from housing association	8.1	9,091	0.39	7.3 - 8.9	1.3
	Rented privately, unfurnished	7.0	9,091	0.33	6.4 - 7.6	1.2
	Rented privately, furnished	2.2	9,091	0.23	1.7 - 2.7	1.5
	Accommodation type					
	Detached house	23.0	9,091	0.61	21.8 - 24.2	1.4
	Semi-detached house	30.9	9,091	0.65	29.6 - 32.2	1.3
	Terraced house	28.1	9,091	0.72	26.7 - 29.5	1.5
	Purpose-built flat or maisonette	14.7	9,091	0.53	13.7 - 15.7	1.4
	Converted flat or maisonette/rooms	3.3	9,091	0.30	2.7 - 3.9	1.6
	With business premises/other	0.1	9,091	0.02	0.1 - 0.1	1.0

Table C.2 Standard errors and 95% confidence intervals for number of persons and cars at each household

Base	Characteristic	%(*p*)	Unweighted sample size	Standard error of *p*	95% confidence intervals	Deft
All households						
	Number of persons					
	1	30.4	9,091	0.55	29.3 - 31.5	1.1
	2	33.3	9,091	0.55	32.2 - 34.4	1.1
	3	16.1	9,091	0.44	15.2 - 17.0	1.2
	4	13.8	9,091	0.39	13.0 - 14.6	1.1
	5	4.7	9,091	0.24	4.2 - 5.2	1.1
	6 or more	1.7	9,091	0.18	1.3 - 2.1	1.4
	Number of cars/light vans					
	1	43.6	9,091	0.60	42.4 - 44.8	1.2
	2 or more	33.7	9,091	0.56	32.6 - 34.8	1.1
	none	22.7	9,091	0.53	21.7 - 23.7	1.2

Table C.3 Standard errors and 95% confidence intervals for households' ownership of selected consumer durables

Base	Characteristic	%(*p*)	Unweighted sample size	Standard error of *p*	95% confidence intervals	Deft
All households						
	Selected consumer durables					
	Home computer	71.1	9,091	0.52	70.1 - 72.1	1.1
	Washing machine	96.3	9,091	0.23	95.8 - 96.8	1.2

Table C.4 Standard errors and 95% confidence intervals for age and sex

Base	Characteristic	%(*p*)	Unweighted sample size	Standard error of *p*	95% confidence intervals	Deft
	Sex					
All persons	Male	49.0	21,472	0.27	48.5 - 49.5	0.8
	Female	51.0	21,472	0.27	50.5 - 51.5	0.8
	Age					
All persons	0-4	6.0	21,472	0.21	5.6 - 6.4	1.3
	5-15	13.1	21,472	0.31	12.5 - 13.7	1.3
	16-44	40.0	21,472	0.43	39.2 - 40.8	1.3
	45-64	25.4	21,472	0.38	24.7 - 26.1	1.3
	65-74	8.4	21,472	0.24	7.9 - 8.9	1.3
	75 and over	7.2	21,472	0.23	6.7 - 7.7	1.3
All males	0-4	6.1	10,395	0.28	5.6 - 6.6	1.2
	5-15	13.7	10,395	0.41	12.9 - 14.5	1.2
	16-44	40.7	10,395	0.57	39.6 - 41.8	1.2
	45-64	25.4	10,395	0.46	24.5 - 26.3	1.1
	65-74	8.1	10,395	0.27	7.6 - 8.6	1.0
	75 and over	6.0	10,395	0.25	5.5 - 6.5	1.1
All females	0-4	5.9	11,077	0.27	5.4 - 6.4	1.2
	5-15	12.5	11,077	0.37	11.8 - 13.2	1.2
	16-44	39.2	11,077	0.48	38.3 - 40.1	1.0
	45-64	25.3	11,077	0.44	24.4 - 26.2	1.1
	65-74	8.6	11,077	0.28	8.1 - 9.1	1.1
	75 and over	8.5	11,077	0.30	7.9 - 9.1	1.1

C.5 Standard errors and 95% confidence intervals for marital status

Base	Characteristic	%(*p*)	Unweighted sample size	Standard error of *p*	95% confidence intervals	Deft
	Marital status					
All persons aged 16 and over	Married	51.1	17,123	0.51	50.1 - 52.1	1.3
	Cohabiting	10.2	17,123	0.39	9.4 - 11.0	1.7
	Single	23.3	17,123	0.41	22.5 - 24.1	1.3
	Widowed	7.0	17,123	0.21	6.6 - 7.4	1.1
	Divorced	6.0	17,123	0.19	5.6 - 6.4	1.1
	Separated	1.8	17,123	0.12	1.6 - 2.0	1.2
Men aged 16 and over	Married	52.6	8,178	0.58	51.5 - 53.7	1.1
	Cohabiting	10.6	8,178	0.40	9.8 - 11.4	1.2
	Single	26.6	8,178	0.57	25.5 - 27.7	1.2
	Widowed	3.6	8,178	0.21	3.2 - 4.0	1.0
	Divorced	4.4	8,178	0.25	3.9 - 4.9	1.1
	Separated	1.5	8,178	0.15	1.2 - 1.8	1.1
Women aged 16 and over	Married	49.7	8,945	0.58	48.6 - 50.8	1.1
	Cohabiting	10.0	8,945	0.38	9.3 - 10.7	1.2
	Single	20.3	8,945	0.50	19.3 - 21.3	1.2
	Widowed	10.2	8,945	0.34	9.5 - 10.9	1.1
	Divorced	7.4	8,945	0.29	6.8 - 8.0	1.1
	Separated	2.1	8,945	0.17	1.8 - 2.4	1.2
All persons aged 16 to 24	Married	3.4	2,015	0.59	2.2 - 4.6	1.6
	Cohabiting	11.0	2,015	1.02	9.0 - 13.0	1.6
	Single	85.1	2,015	1.19	82.8 - 87.4	1.7
	Widowed	0.0	2,015	0.03	-0.1 - 0.1	0.9
	Divorced	0.0	2,015	0.03	-0.1 - 0.1	0.8
	Separated	0.2	2,015	0.10	0.0 - 0.4	1.2
All persons aged 25 to 34	Married	38.7	2,215	1.35	36.1 - 41.3	1.4
	Cohabiting	26.0	2,215	1.35	23.4 - 28.6	1.6
	Single	30.5	2,215	1.27	28.0 - 33.0	1.4
	Widowed	0.0	2,215	0.05	-0.1 - 0.1	1.1
	Divorced	1.6	2,215	0.32	1.0 - 2.2	1.3
	Separated	1.8	2,215	0.31	1.2 - 2.4	1.2
All persons aged 35 to 44	Married	59.9	3,238	1.18	57.6 - 62.2	1.4
	Cohabiting	14.1	3,238	0.80	12.5 - 15.7	1.4
	Single	15.5	3,238	0.80	13.9 - 17.1	1.3
	Widowed	0.4	3,238	0.19	0.0 - 0.8	1.7
	Divorced	6.7	3,238	0.50	5.7 - 7.7	1.2
	Separated	2.9	3,238	0.36	2.2 - 3.6	1.3
All persons aged 45 to 54	Married	70.3	2,883	1.09	68.2 - 72.4	1.3
	Cohabiting	7.2	2,883	0.62	6.0 - 8.4	1.3
	Single	9.0	2,883	0.65	7.7 - 10.3	1.2
	Widowed	0.8	2,883	0.17	0.5 - 1.1	1.1
	Divorced	9.9	2,883	0.65	8.6 - 11.2	1.2
	Separated	2.4	2,883	0.34	1.7 - 3.1	1.2
All persons aged 55 to 64	Married	71.3	2,908	1.03	69.3 - 73.3	1.2
	Cohabiting	3.7	2,908	0.42	2.9 - 4.5	1.1
	Single	6.1	2,908	0.52	5.1 - 7.1	1.1
	Widowed	5.4	2,908	0.50	4.4 - 6.4	1.1
	Divorced	11.5	2,908	0.70	10.1 - 12.9	1.1
	Separated	1.8	2,908	0.27	1.3 - 2.3	1.0
All persons aged 65 to 74	Married	68.1	2,198	1.12	65.9 - 70.3	1.0
	Cohabiting	1.7	2,198	0.33	1.1 - 2.3	1.1
	Single	4.6	2,198	0.49	3.6 - 5.6	1.0
	Widowed	16.9	2,198	0.90	15.1 - 18.7	1.0
	Divorced	6.7	2,198	0.57	5.6 - 7.8	1.0
	Separated	1.9	2,198	0.30	1.3 - 2.5	0.9
All persons aged 75 and over	Married	41.1	1,666	1.39	38.4 - 43.8	1.1
	Cohabiting	0.5	1,666	0.20	0.1 - 0.9	1.1
	Single	6.2	1,666	0.67	4.9 - 7.5	1.1
	Widowed	47.2	1,666	1.43	44.4 - 50.0	1.1
	Divorced	4.3	1,666	0.56	3.2 - 5.4	1.1
	Separated	0.7	1,666	0.21	0.3 - 1.1	1.0

C.5a Standard errors of change for marital status

Base	Characteristic	%(*diff_p*)	Standard error of *diff_p*
	Marital status		
All persons aged 16 and over	Married	0.3	0.47
	Cohabiting	0.4	0.35
	Single	-0.5	0.43
	Widowed	0.0	0.19
	Divorced	-0.1	0.19
	Separated	-0.1	0.12
Men aged 16 and over	Married	0.3	0.58
	Cohabiting	0.4	0.37
	Single	-0.7	0.61
	Widowed	0.1	0.18
	Divorced	-0.1	0.25
	Separated	-0.1	0.17
Women aged 16 and over	Married	0.2	0.52
	Cohabiting	0.3	0.35
	Single	-0.3	0.49
	Widowed	-0.1	0.30
	Divorced	-0.1	0.29
	Separated	-0.2	0.18
All persons aged 16 to 24	Married	-0.7	0.60
	Cohabiting	0.8	1.04
	Single	-0.2	1.13
	Widowed	0.0	0.03
	Divorced	0.0	0.06
	Separated	-0.2	0.13
All persons aged 25 to 34	Married	-0.5	1.41
	Cohabiting	1.6	1.31
	Single	-1.2	1.29
	Widowed	-0.1	0.09
	Divorced	-0.5	0.33
	Separated	0.3	0.33
All persons aged 35 to 44	Married	-1.2	1.03
	Cohabiting	1.3	0.76
	Single	0.1	0.74
	Widowed	-0.1	0.14
	Divorced	-0.3	0.50
	Separated	0.1	0.38
All persons aged 45 to 54	Married	1.7	1.00
	Cohabiting	-0.1	0.60
	Single	0.5	0.60
	Widowed	-0.3	0.19
	Divorced	-1.1	0.61
	Separated	-0.7	0.37
All persons aged 55 to 64	Married	-0.8	0.89
	Cohabiting	-0.3	0.42
	Single	-0.3	0.45
	Widowed	0.5	0.42
	Divorced	1.4	0.63
	Separated	-0.4	0.31
All persons aged 65 to 74	Married	2.0	1.05
	Cohabiting	-0.4	0.37
	Single	-0.6	0.50
	Widowed	-0.5	0.82
	Divorced	-0.8	0.58
	Separated	0.3	0.32
All persons aged 75 and over	Married	-0.2	1.32
	Cohabiting	-0.5	0.33
	Single	0.5	0.63
	Widowed	0.2	1.30
	Divorced	0.3	0.56
	Separated	-0.1	0.28

Table C.6 Standard errors and 95% confidence intervals for ethnic origin

Base	Characteristic	%(*p*)	Unweighted sample size	Standard error of *p*	95% confidence intervals	Deft
All persons aged 16 and over						
	Ethnic origin					
	White	91.5	17,088	0.61	90.3 - 92.7	2.9
	Mixed race	0.8	17,088	0.10	0.6 - 1.0	1.5
	Asian-Indian	1.8	17,088	0.33	1.2 - 2.4	3.3
	Asian-Pakistani, Bangladeshi, Other	2.3	17,088	0.38	1.6 - 3.0	3.3
	Black Caribbean	1.1	17,088	0.24	0.6 - 1.6	3.0
	Black African	1.3	17,088	0.19	0.9 - 1.7	2.2
	Other	1.3	17,088	0.17	1.0 - 1.6	2.0

Table C.7 Standard errors and 95% confidence intervals for education level

Base	Characteristic	%(*p*)	Unweighted sample size	Standard error of *p*	95% confidence intervals	Deft
	Education level					
All persons aged 16 to 69	Higher education	33.0	14,295	0.68	31.7 - 34.3	1.7
	Other qualifications	42.9	14,295	0.59	41.7 - 44.1	1.4
	None	24.0	14,295	0.57	22.9 - 25.1	1.6
All men aged 16 to 69	Higher education	34.1	6,541	0.82	32.5 - 35.7	1.4
	Other qualifications	44.0	6,541	0.79	42.5 - 45.5	1.3
	None	21.9	6,541	0.70	20.5 - 23.3	1.4
All women aged 16 to 69	Higher education	32.1	7,754	0.74	30.6 - 33.6	1.4
	Other qualifications	42.0	7,754	0.65	40.7 - 43.3	1.2
	None	25.9	7,754	0.63	24.7 - 27.1	1.3

Table C.8 Standard errors and 95% confidence intervals for socio-economic classification and employment status of adults

Base	Characteristic	%(*p*)	Unweighted sample size	Standard error of *p*	95% confidence intervals	Deft
	Socio-economic classification					
All persons aged 16 and over	Higher managerial and professional	13.0	15,861	0.38	12.3 - 13.7	1.4
	Lower managerial and professional	22.4	15,861	0.42	21.6 - 23.2	1.3
	Intermediate	12.6	15,861	0.30	12.0 - 13.2	1.1
	Small employers and own account	8.3	15,861	0.27	7.8 - 8.8	1.3
	Lower supervisory and technical	9.1	15,861	0.28	8.6 - 9.6	1.2
	Semi-routine	17.2	15,861	0.37	16.5 - 17.9	1.2
	Routine	12.8	15,861	0.36	12.1 - 13.5	1.4
	Never worked and long-term unemployed	4.5	15,861	0.27	4.0 - 5.0	1.6
All men aged 16 and over	Higher managerial and professional	19.0	7,542	0.61	17.8 - 20.2	1.4
	Lower managerial and professional	20.0	7,542	0.53	19.0 - 21.0	1.2
	Intermediate	6.1	7,542	0.32	5.5 - 6.7	1.2
	Small employers and own account	12.1	7,542	0.46	11.2 - 13.0	1.2
	Lower supervisory and technical	13.5	7,542	0.46	12.6 - 14.4	1.2
	Semi-routine	11.8	7,542	0.47	10.9 - 12.7	1.3
	Routine	14.1	7,542	0.50	13.1 - 15.1	1.3
	Never worked and long-term unemployed	3.4	7,542	0.28	2.9 - 3.9	1.4
All women aged 16 and over	Higher managerial and professional	7.4	8,319	0.32	6.8 - 8.0	1.1
	Lower managerial and professional	24.7	8,319	0.58	23.6 - 25.8	1.2
	Intermediate	18.8	8,319	0.49	17.8 - 19.8	1.1
	Small employers and own account	4.8	8,319	0.24	4.3 - 5.3	1.0
	Lower supervisory and technical	5.0	8,319	0.28	4.5 - 5.5	1.2
	Semi-routine	22.1	8,319	0.52	21.1 - 23.1	1.1
	Routine	11.7	8,319	0.44	10.8 - 12.6	1.2
	Never worked and long-term unemployed	5.5	8,319	0.38	4.8 - 6.2	1.5
All persons aged 16 to 44	Higher managerial and professional	14.2	6,380	0.57	13.1 - 15.3	1.4
	Lower managerial and professional	23.4	6,380	0.63	22.2 - 24.6	1.3
	Intermediate	12.7	6,380	0.46	11.8 - 13.6	1.2
	Small employers and own account	6.8	6,380	0.36	6.1 - 7.5	1.2
	Lower supervisory and technical	8.6	6,380	0.42	7.8 - 9.4	1.3
	Semi-routine	16.7	6,380	0.58	15.6 - 17.8	1.3
	Routine	10.8	6,380	0.50	9.8 - 11.8	1.4
	Never worked and long-term unemployed	6.8	6,380	0.46	5.9 - 7.7	1.5
All persons aged 45 to 64	Higher managerial and professional	13.9	5,644	0.53	12.9 - 14.9	1.1
	Lower managerial and professional	23.7	5,644	0.67	22.4 - 25.0	1.2
	Intermediate	11.7	5,644	0.48	10.8 - 12.6	1.1
	Small employers and own account	10.1	5,644	0.49	9.1 - 11.1	1.2
	Lower supervisory and technical	8.8	5,644	0.42	8.0 - 9.6	1.1
	Semi-routine	16.7	5,644	0.55	15.6 - 17.8	1.1
	Routine	12.8	5,644	0.58	11.7 - 13.9	1.3
	Never worked and long-term unemployed	2.4	5,644	0.29	1.8 - 3.0	1.4
All persons aged 65 to 74	Higher managerial and professional	9.8	2,184	0.67	8.5 - 11.1	0.9
	Lower managerial and professional	17.3	2,184	0.82	15.7 - 18.9	0.9
	Intermediate	13.0	2,184	0.69	11.6 - 14.4	0.9
	Small employers and own account	9.9	2,184	0.70	8.5 - 11.3	1.0
	Lower supervisory and technical	10.7	2,184	0.74	9.2 - 12.2	1.0
	Semi-routine	19.0	2,184	0.87	17.3 - 20.7	0.9
	Routine	18.5	2,184	0.95	16.6 - 20.4	1.0
	Never worked and long-term unemployed	1.9	2,184	0.32	1.3 - 2.5	1.0
All persons aged 75 and over	Higher managerial and professional	8.2	1,653	0.67	6.9 - 9.5	1.0
	Lower managerial and professional	19.6	1,653	1.03	17.6 - 21.6	1.0
	Intermediate	15.4	1,653	0.98	13.5 - 17.3	1.1
	Small employers and own account	7.6	1,653	0.70	6.2 - 9.0	1.0
	Lower supervisory and technical	10.6	1,653	0.78	9.1 - 12.1	1.0
	Semi-routine	18.9	1,653	1.09	16.8 - 21.0	1.1
	Routine	15.9	1,653	1.07	13.8 - 18.0	1.1
	Never worked and long-term unemployed	3.9	1,653	0.57	2.8 - 5.0	1.2
	Employment status					
All persons aged 16 and over	In employment	60.6	16,835	0.55	59.5 - 61.7	1.5
	Unemployed	2.2	16,835	0.15	1.9 - 2.5	1.3
	Economically inactive	37.2	16,835	0.53	36.2 - 38.2	1.4
All men aged 16 and over	In employment	66.3	8,002	0.64	65.0 - 67.6	1.2
	Unemployed	2.8	8,002	0.24	2.3 - 3.3	1.3
	Economically inactive	30.9	8,002	0.59	29.7 - 32.1	1.2

Table C.9 Standard errors and 95% confidence intervals for health measures

Base	Characteristic	%(*p*)	Unweighted sample size	Standard error of *p*	95% confidence intervals	Deft
	Self-reported sickness					
All persons	Longstanding illness	31.5	20,004	0.46	30.6 - 32.4	1.4
	Limiting longstanding illness	17.3	21,162	0.34	16.6 - 18.0	1.3
	Restricted activity in the last 14 days	11.9	20,006	0.33	11.3 - 12.5	1.4
All males	Longstanding illness	31.0	9,477	0.59	29.8 - 32.2	1.2
	Limiting longstanding illness	16.1	10,211	0.42	15.3 - 16.9	1.2
	Restricted activity in the last 14 days	10.9	9,479	0.41	10.1 - 11.7	1.3
All females	Longstanding illness	31.9	10,527	0.55	30.8 - 33.0	1.2
	Limiting longstanding illness	18.4	10,951	0.43	17.6 - 19.2	1.1
	Restricted activity in the last 14 days	12.8	10,527	0.42	12.0 - 13.6	1.3
All persons aged 0 to 4	Longstanding illness	9.7	1,223	0.91	7.9 - 11.5	1.1
	Limiting longstanding illness	2.9	1,227	0.46	2.0 - 3.8	1.0
	Restricted activity in the last 14 days	7.1	1,223	0.80	5.5 - 8.7	1.1
All persons aged 5 to 15	Longstanding illness	15.8	3,110	0.82	14.2 - 17.4	1.2
	Limiting longstanding illness	5.7	3,118	0.49	4.7 - 6.7	1.1
	Restricted activity in the last 14 days	6.9	3,110	0.55	5.8 - 8.0	1.2
All persons aged 16 to 44	Longstanding illness	20.8	6,517	0.58	19.7 - 21.9	1.2
	Limiting longstanding illness	10.0	7,251	0.40	9.2 - 10.8	1.2
	Restricted activity in the last 14 days	10.3	6,520	0.46	9.4 - 11.2	1.3
All persons aged 45 to 64	Longstanding illness	42.2	5,410	0.85	40.5 - 43.9	1.2
	Limiting longstanding illness	23.5	5,716	0.70	22.1 - 24.9	1.2
	Restricted activity in the last 14 days	14.7	5,410	0.62	13.5 - 15.9	1.2
All persons aged 65 to 74	Longstanding illness	57.6	2,128	1.25	55.2 - 60.1	1.1
	Limiting longstanding illness	35.5	2,191	1.11	33.3 - 37.7	1.0
	Restricted activity in the last 14 days	16.0	2,127	0.87	14.3 - 17.7	1.0
All persons aged 75+	Longstanding illness	65.3	1,616	1.35	62.7 - 67.9	1.1
	Limiting longstanding illness	46.7	1,659	1.36	44.0 - 49.4	1.1
	Restricted activity in the last 14 days	19.1	1,616	1.14	16.9 - 21.3	1.1

Table C.9a Standard errors of change for health measures

Base	Characteristic	%(*diff_p*)	Standard error of *diff_p*
	Self-reported sickness		
All persons	Longstanding illness	-1.9	0.51
	Limiting longstanding illness	-0.3	0.36
	Restricted activity in the last 14 days	-0.7	0.38
All males	Longstanding illness	-1.6	0.63
	Limiting longstanding illness	0.6	0.45
	Restricted activity in the last 14 days	-0.1	0.48
All females	Longstanding illness	-2.2	0.62
	Limiting longstanding illness	-1.1	0.46
	Restricted activity in the last 14 days	-1.2	0.51
All persons aged 0 to 4	Longstanding illness	-1.3	1.18
	Limiting longstanding illness	-0.5	0.66
	Restricted activity in the last 14 days	-0.6	1.17
All persons aged 5 to 15	Longstanding illness	-0.4	0.92
	Limiting longstanding illness	-0.8	0.61
	Restricted activity in the last 14 days	-0.6	0.72
All persons aged 16 to 44	Longstanding illness	-1.2	0.69
	Limiting longstanding illness	0.3	0.46
	Restricted activity in the last 14 days	0.1	0.56
All persons aged 45 to 64	Longstanding illness	-2.3	0.95
	Limiting longstanding illness	-0.4	0.75
	Restricted activity in the last 14 days	-0.7	0.72
All persons aged 65 to 74	Longstanding illness	-5.4	1.45
	Limiting longstanding illness	-1.6	1.24
	Restricted activity in the last 14 days	-2.6	1.19
All persons aged 75+	Longstanding illness	-4.7	1.60
	Limiting longstanding illness	-1.5	1.55
	Restricted activity in the last 14 days	-3.1	1.47

Table C.10 Standard errors and 95% confidence intervals for cigarette smoking

Base	Characteristic	%(*p*)	Unweighted sample size	Standard error of *p*	95% confidence intervals	Deft
	Cigarette smoking					
All persons aged 16 and over	Current cigarette smoker	20.9	15,620	0.48	20.0 - 21.8	1.5
	Ex-regular cigarette smoker	24.4	15,620	0.46	23.5 - 25.3	1.3
	Never regularly smoked cigarettes	54.8	15,620	0.59	53.6 - 56.0	1.5
All men aged 16 and over	Current cigarette smoker	22.1	7,242	0.64	20.8 - 23.4	1.3
	Ex-regular cigarette smoker	28.0	7,242	0.64	26.7 - 29.3	1.2
	Never regularly smoked cigarettes	49.9	7,242	0.75	48.4 - 51.4	1.3
All women aged 16 and over	Current cigarette smoker	19.7	8,378	0.54	18.6 - 20.8	1.2
	Ex-regular cigarette smoker	21.2	8,378	0.53	20.2 - 22.2	1.2
	Never regularly smoked cigarettes	59.1	8,378	0.68	57.8 - 60.4	1.3

Table C.10a Standard errors of change for cigarette smoking

Base	Characteristic	%(*diff_p*)	Standard error of *diff_p*
	Cigarette smoking		
All persons aged 16 and over	Current cigarette smoker	-1.1	0.43
	Ex-regular cigarette smoker	0.7	0.47
	Never regularly smoked cigarettes	0.5	0.55
All men aged 16 and over	Current cigarette smoker	-1.0	0.60
	Ex-regular cigarette smoker	0.9	0.64
	Never regularly smoked cigarettes	0.2	0.74
All women aged 16 and over	Current cigarette smoker	-1.2	0.48
	Ex-regular cigarette smoker	0.4	0.55
	Never regularly smoked cigarettes	0.7	0.64

Table C.11 Standard errors and 95% confidence intervals for alcohol consumption (maximum daily amount)

Base	Characteristic	%(*p*)	Unweighted sample size	Standard error of *p*	95% confidence intervals	Deft
	Alcohol consumption (maximum daily amount)					
All men aged 16 and over	Drank nothing last week	28.0	7,232	0.69	26.6 - 29.4	1.3
	Drank up to 4 units	30.8	7,232	0.61	29.6 - 32.0	1.1
	Drank more than 4 and up to 8 units	16.8	7,232	0.47	15.9 - 17.7	1.1
	Drank more than 8 units	24.4	7,232	0.63	23.2 - 25.6	1.3
All women aged 16 and over	Drank nothing last week	43.2	8,383	0.71	41.8 - 44.6	1.3
	Drank up to 3 units	22.9	8,383	0.52	21.9 - 23.9	1.1
	Drank more than 3 and up to 6 units	18.6	8,383	0.47	17.7 - 19.5	1.1
	Drank more than 6 units	15.3	8,383	0.50	14.3 - 16.3	1.3
All aged 16 to 24	Drank nothing last week	41.5	1,560	1.51	38.5 - 44.5	1.3
	Drank up to 4/3 units	16.4	1,560	1.05	14.3 - 18.5	1.2
	Drank more than 4/3 and up to 8/6 units	13.9	1,560	1.01	11.9 - 15.9	1.3
	Drank more than 8/6 units	28.1	1,560	1.39	25.4 - 30.8	1.4
All aged 25 to 44	Drank nothing last week	32.6	4,917	0.88	30.9 - 34.3	1.4
	Drank up to 4/3 units	22.3	4,917	0.70	20.9 - 23.7	1.2
	Drank more than 4/3 and up to 8/6 units	18.9	4,917	0.61	17.7 - 20.1	1.2
	Drank more than 8/6 units	26.2	4,917	0.83	24.6 - 27.8	1.4
All aged 45 to 64	Drank nothing last week	31.8	5,399	0.83	30.2 - 33.4	1.3
	Drank up to 4/3 units	28.5	5,399	0.76	27.0 - 30.0	1.2
	Drank more than 4/3 and up to 8/6 units	21.2	5,399	0.62	20.0 - 22.4	1.1
	Drank more than 8/6 units	18.4	5,399	0.63	17.2 - 19.6	1.2
All aged 65 and over	Drank nothing last week	45.3	3,739	0.97	43.4 - 47.2	1.1
	Drank up to 4/3 units	36.8	3,739	0.90	35.0 - 38.6	1.1
	Drank more than 4/3 and up to 8/6 units	12.8	3,739	0.61	11.6 - 14.0	1.0
	Drank more than 8/6 units	5.2	3,739	0.41	4.4 - 6.0	1.0
All aged 16 and over	Drank nothing last week	36.1	15,615	0.59	34.9 - 37.3	1.6
	Drank up to 4/3 units	26.6	15,615	0.44	25.7 - 27.5	1.3
	Drank more than 4/3 and up to 8/6 units	17.8	15,615	0.36	17.1 - 18.5	1.2
	Drank more than 8/6 units	19.6	15,615	0.46	18.7 - 20.5	1.5

Table C.11a Standard errors of change for alcohol consumption (maximum daily amount)

Base	Characteristic	%(*diff_p*)	Standard error of *diff_p*
	Alcohol consumption (maximum daily amount)		
All men aged 16 and over	Drank nothing last week	-0.9	0.76
	Drank up to 4 units	-7.0	0.80
	Drank more than 4 and up to 8 units	1.6	0.65
	Drank more than 8 units	6.3	0.72
All women aged 16 and over	Drank nothing last week	-0.9	0.75
	Drank up to 3 units	-13.2	0.68
	Drank more than 3 and up to 6 units	6.9	0.56
	Drank more than 6 units	7.3	0.53
All aged 16 to 24	Drank nothing last week	-2.4	1.88
	Drank up to 4/3 units	-3.3	1.45
	Drank more than 4/3 and up to 8/6 units	1.4	1.27
	Drank more than 8/6 units	4.3	1.68
All aged 25 to 44	Drank nothing last week	-1.1	0.99
	Drank up to 4/3 units	-10.3	0.93
	Drank more than 4/3 and up to 8/6 units	3.0	0.83
	Drank more than 8/6 units	8.4	0.90
All aged 45 to 64	Drank nothing last week	-0.4	0.89
	Drank up to 4/3 units	-14.3	0.98
	Drank more than 4/3 and up to 8/6 units	5.9	0.77
	Drank more than 8/6 units	8.8	0.69
All aged 65 and over	Drank nothing last week	-0.4	1.06
	Drank up to 4/3 units	-9.1	1.15
	Drank more than 4/3 and up to 8/6 units	6.4	0.69
	Drank more than 8/6 units	3.1	0.45
All aged 16 and over	Drank nothing last week	-0.9	0.62
	Drank up to 4/3 units	-10.3	0.57
	Drank more than 4/3 and up to 8/6 units	4.4	0.45
	Drank more than 8/6 units	6.8	0.50

Table C.12 Standard errors and 95% confidence intervals for number of cohabitations

Base	Characteristic	%(*p*)	Unweighted sample size	Standard error of *p*	95% confidence intervals	Deft
	Number of cohabitations					
All women aged 16 to 59	None	84.4	5,255	0.58	83.3 - 85.5	1.2
	One	12.0	5,255	0.51	11.0 - 13.0	1.1
	Two or more	3.6	5,255	0.29	3.0 - 4.2	1.2
All men aged 16 to 59	None	86.1	4,321	0.61	84.9 - 87.3	1.2
	One	9.5	4,321	0.49	8.5 - 10.5	1.1
	Two or more	4.4	4,321	0.37	3.7 - 5.1	1.2
All people aged 16 to 24	None	93.1	1,242	0.79	91.6 - 94.6	1.2
	One	5.9	1,242	0.76	4.4 - 7.4	1.2
	Two or more	1.0	1,242	0.28	0.5 - 1.5	1.1
All people aged 25 to 34	None	81.0	1,797	1.04	79.0 - 83.0	1.2
	One	14.8	1,797	0.93	13.0 - 16.6	1.2
	Two or more	4.2	1,797	0.53	3.2 - 5.2	1.2
All people aged 35 to 44	None	78.1	2,739	1.02	76.1 - 80.1	1.3
	One	14.8	2,739	0.82	13.2 - 16.4	1.2
	Two or more	7.0	2,739	0.57	5.9 - 8.1	1.2
All people aged 45 to 54	None	87.8	2,496	0.73	86.4 - 89.2	1.1
	One	9.2	2,496	0.63	8.0 - 10.4	1.1
	Two or more	3.0	2,496	0.38	2.3 - 3.7	1.1
All people aged 55 to 59	None	94.5	1,302	0.65	93.2 - 95.8	1.0
	One	3.6	1,302	0.54	2.5 - 4.7	1.0
	Two or more	1.9	1,302	0.37	1.2 - 2.6	0.9
All people aged 16 to 59	None	85.2	9,576	0.44	84.3 - 86.1	1.2
	One	10.8	9,576	0.37	10.1 - 11.5	1.2
	Two or more	4.0	9,576	0.23	3.5 - 4.5	1.2