Quick Guide to the survey

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Date: December 2013
Prepared for: Health and Social Care Information Centre
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1 Design and sample

1.1 Health Survey for England report structure

This Quick Guide to the Health Survey for England (HSE) 2012 is designed as a reference tool to introduce the main methods sections of the survey, and signpost the reader to where further information can be found.

Hard copies of the full HSE 2012 report will be available in summer 2014. There will be three separate documents:

- Volume 1: substantive findings, with chapters on adult and child physical activity, mental and physical health, well-being, alcohol consumption, gambling, social care and adult and children’s anthropometric measures.
- Volume 2: methods and documentation, giving the full account of the technical aspects of the 2012 survey.
- A summary of key findings.

The full HSE 2012 report can also be found online at: www.hscic.gov.uk/pubs/hse2012 As well as a single Volume 1 online, each chapter is also presented as a separate PDF.

1.2 Brief introduction to the HSE

The HSE is a series of annual surveys, of which the 2012 survey is the 22nd. The surveys provide regular information that cannot be obtained from other sources on a range of issues related to the public’s health and many of the factors that affect health.

Each survey in the series includes core questions, for example on smoking and drinking, and measurements such as blood pressure, anthropometric measurements and analysis of blood, urine and saliva samples, as well as modules of questions or measurements on specific issues that vary from year to year. In some years, the core sample has also been augmented by an additional boosted sample from a specific population subgroup, such as minority ethnic groups, older people or children. There was no boost in 2012.

Data collection in 2012 involved an interview including a self-completion questionnaire. This was followed by a visit from a specially trained nurse for all those who agreed. Height and weight were measured during the interview, and the nurse visit included measurements and collection of blood, urine and saliva samples, as well as additional questions.

For a more detailed introduction to the HSE 2012 see Volume 2 of the 2012 report, Methods and documentation, Section 1: www.hscic.gov.uk/pubs/hse2012

1.3 Availability of data

As with previous years, only a proportion of the HSE results are included in the 2012 report and 2012 trend tables. A copy of the full HSE 2012 dataset will be deposited with the UK Data Service (UKDS). Copies of the anonymised data files from 2012 and every other HSE year from 1993 can be made available for specific research projects through the UKDS. Full documentation is available in the archive, including a list of all the variables and definitions for derived variables.

For further information go to: http://discover.ukdataservice.ac.uk/series/?sn=2000021

1.4 HSE 2012 trend tables

In addition to the full 2012 report, 2012 results are incorporated into trend tables which focus on key trends in the health of adults and children since 1993, or the earliest year for which comparable data are available. Population number estimates are also provided for some topics. A brief commentary on the trends highlights key patterns.
Topics included in trend tables for adults:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood pressure</td>
<td>Fruit and vegetable consumption*</td>
</tr>
<tr>
<td>Mean height &amp; weight</td>
<td>General health</td>
</tr>
<tr>
<td>Body mass index*</td>
<td>Longstanding illness, acute sickness</td>
</tr>
<tr>
<td>Mean waist circumference</td>
<td>Prevalence of IHD or stroke</td>
</tr>
<tr>
<td>Estimated alcohol consumption*</td>
<td>Prevalence of diabetes</td>
</tr>
<tr>
<td>Self-reported cigarette smoking*</td>
<td>Levels of physical activity*</td>
</tr>
</tbody>
</table>

*Population number estimates are also available for these topics.

Topics included in trend tables for children:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean height &amp; weight</td>
<td>Fruit and vegetable consumption*</td>
</tr>
<tr>
<td>Body mass index</td>
<td>General health</td>
</tr>
<tr>
<td>Overweight and obesity prevalence*</td>
<td>Longstanding illness</td>
</tr>
<tr>
<td>Self-reported cigarette smoking</td>
<td>Acute sickness</td>
</tr>
<tr>
<td>Self-reported experience of alcohol</td>
<td>Levels of physical activity*</td>
</tr>
</tbody>
</table>

*Population number estimates are also available for these topics.

The full trend tables, population number estimate tables and commentary can be found online at: www.hscic.gov.uk/pubs/hse2012trend

1.5 Sample size

The achieved sample size for 2012 at the interview stage was 8,291 adults and 2,043 children. 5,470 adults and 1,203 children had a nurse visit. A total of 4,112 adults provided a blood sample.

1.6 Sample design

As with all previous surveys, the HSE 2012 involved a multi-stage, stratified, random probability sample designed to be representative of the population living in private households in England. Those living in institutions (such as care homes) were outside the scope of the survey.

The sampling frame was the small user Postcode Address File (PAF). The very small proportion of households living in addresses not on PAF (less than 1%) was not covered. The sample consisted of 9,024 addresses selected at random from 564 postcode addresses.

All HSE surveys cover the adult population aged 16 and over living in private households in England. From 1995, the survey included children aged 2-15, and from 2001 infants aged under 2 have also been included. Where there were three or more children in a household, two of the children were selected at random to limit the respondent burden for parents.

For more detailed information about the sample design see Volume 2 of the 2012 report, Methods and documentation, Section 2: www.hscic.gov.uk/pubs/hse2012

The complex survey design, and the method of weighting the data (see Sections 3.1 and 3.2 of this guide) mean that analysis and statistical tests for significance should be done in a package which takes the complex survey design into account, e.g. STATA or SPSS 15 or later versions.

2 Data collection and response

2.1 Ethical approval

Ethical approval for the 2012 survey was obtained from the Oxford A Research Ethics Committee (reference number 10/H0604/56).
2.2 **Data collection**

Data collection involved both interviews and self-completion. Adults were asked to participate in a face to face interview lasting around 60-65 minutes which included a self-completion questionnaire; this was followed by a nurse visit.

Children aged 0-15 were also interviewed and were eligible for a nurse visit; those aged 13-15 answered on their own behalf while parents answered on behalf of children aged 0-12.

2.3 **Topic coverage**

Further information about topic coverage can be found in Volume 2 of the 2012 report, Methods and documentation, Section 3: www.hscic.gov.uk/pubs/hse2012

Figure A summarises the household and individual level questionnaire coverage.

2.4 **Fieldwork procedures, documents and protocols**

Full details of the fieldwork procedures can be found in Volume 2 of the 2012 report, Methods and documentation, Sections 4 and 5: www.hscic.gov.uk/pubs/hse2012. Copies of the fieldwork documents are provided in Appendix A, and the protocols used for measurements and sample collection are in Appendix B of Volume 2.

2.5 **Interview length**

Interviews could be conducted with between one and four persons per session; the most common session types were with one or two individuals. Interview length for a single adult averaged around 50 minutes, and for two people (including at least one adult) interview length averaged around 60-65 minutes. Nurse visits were conducted with a single individual at a time, and the nurse visit for adults who took part in all the measurements averaged 30 minutes.

Interviews with children were shorter than with adults, and the interview length varied with age as some modules were asked only of older children. When an interview session included only children, the average interview length was around 10-15 minutes for a single child aged 8-15, and around 20 minutes for two children of this age.

Further information about interview length can be found in Volume 2 of the 2012 report, Methods and documentation, Section 4.5: www.hscic.gov.uk/pubs/hse2012

2.6 **Consents**

**Verbal consent** was obtained for the following during the interview or nurse visit:

- Interview
- Nurse visit
- Taking height and weight measurements
- Taking waist and hip measurements
- Taking blood pressure measurements

**Written consent** was obtained for the following during the interview or nurse visit:

- Collecting blood, urine and saliva samples
- Sending results from the nurse visit to the GP
- Storing a small amount of the blood sample
- Data linkage of survey results to the Hospital Episode Statistics and the NHS Central Register for mortality and cancer.

Fully informed consent requires a full explanation of the study and what is required of the participant. Assent - seeking the child’s agreement - requires a clear, age-appropriate explanation which is comprehensible rather than comprehensive, since consent will be sought from the parent.

Adults aged 16 and over gave consent. Parents gave verbal or written consent for their
## Health Survey for England 2012: Contents

### Household data
- Household size, composition and relationships
- Accommodation tenure and number of bedrooms
- Economic status/occupation of Household
- Reference Person

### Household income
- Type of dwelling and area
- Smoking in household
- Car ownership

### Individual level information

<table>
<thead>
<tr>
<th>Interviewer visit</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-1</td>
</tr>
<tr>
<td>General health, longstanding illness, limiting longstanding illness, acute sickness</td>
<td>●</td>
</tr>
<tr>
<td>Personal care plans</td>
<td>●</td>
</tr>
<tr>
<td>Self-reported height and weight</td>
<td>●</td>
</tr>
<tr>
<td>Doctor-diagnosed hypertension, diabetes</td>
<td>●</td>
</tr>
<tr>
<td>Social care</td>
<td>●</td>
</tr>
<tr>
<td>Adult physical activity</td>
<td>●</td>
</tr>
<tr>
<td>Child physical activity</td>
<td>●</td>
</tr>
<tr>
<td>Smoking</td>
<td>●</td>
</tr>
<tr>
<td>Drinking (heaviest drinking day last week, regular drinking)</td>
<td>●</td>
</tr>
<tr>
<td>Economic status/occupation, educational achievement</td>
<td>●</td>
</tr>
<tr>
<td>Ethnic origin</td>
<td>●</td>
</tr>
<tr>
<td>Reported birth weight</td>
<td>●</td>
</tr>
<tr>
<td>Height measurement</td>
<td>●</td>
</tr>
<tr>
<td>Weight measurement</td>
<td>●</td>
</tr>
<tr>
<td>Consent to linkage to NHS Central Register/Hospital Episodes Statistics</td>
<td>●</td>
</tr>
</tbody>
</table>

### Self-completion
- GHQ-12
- EQ-5D
- Gambling
- Sexual health
- Perception of own weight/child’s weight
- Sexual orientation, religion

### Nurse visit
- Immunisations
- Prescribed medicines
- Nicotine replacement products
- Waist and hip circumference
- Blood pressure
- Saliva sample
- Urine sample
- Blood sample (non-fasting)

### Nurse self-completion
- Warwick-Edinburgh mental well-being scale

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*a This module was administered by self-completion for children aged 8-15.
b This module was administered by self-completion for those aged 16-17 and some aged 18-24.
children aged 0-15, and the children themselves gave verbal assent for the interview, nurse visit and measurements. If children were able to, they gave written assent for results being sent to their GP and giving a saliva sample.

2.8 Fieldwork period
Addresses were issued in 12 monthly batches from January to December 2012, and fieldwork was completed by the end of February 2013.

2.8 Response rate
A household response rate of 64% (5,219 households) was achieved.

A total of 8,291 adults and 2,043 children were interviewed. This is an individual response rate of 56% of all eligible adults and 62% of all eligible children. Within co-operating households, 85% of all adults and 92% of selected children were interviewed.

A total of 5,470 adults and 1,203 children had a nurse visit. Tables 1 and 2 show the response rates for the different stages of the survey, both for all eligible adults and children, and for adults and children in co-operating households.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Adult response rates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All eligible adults</td>
</tr>
<tr>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Interviewed</td>
<td>56</td>
</tr>
<tr>
<td>Height measured</td>
<td>49</td>
</tr>
<tr>
<td>Weight measured</td>
<td>48</td>
</tr>
<tr>
<td>Saw a nurse</td>
<td>37</td>
</tr>
<tr>
<td>Waist and hip measured</td>
<td>36</td>
</tr>
<tr>
<td>Blood pressure measured</td>
<td>36</td>
</tr>
<tr>
<td>Blood sample given</td>
<td>28</td>
</tr>
<tr>
<td>Urine sample given</td>
<td>32</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Child response rates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All eligible children</td>
</tr>
<tr>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Interviewed</td>
<td>62</td>
</tr>
<tr>
<td>Height measured</td>
<td>41</td>
</tr>
<tr>
<td>Weight measured</td>
<td>47</td>
</tr>
<tr>
<td>Saw a nurse</td>
<td>37</td>
</tr>
</tbody>
</table>

The response rate varied by region and type of household dwelling, as well as the age and sex profile of the sample.

For a more detailed breakdown of the survey response and response analysis see Volume 2 of the 2012 report, Methods and documentation, Section 6: www.hscic.gov.uk/pubs/hse2012

3 Analysis

3.1 Weighting the data
Weighting is applied to HSE 2012 data to correct for probabilities of selection and to minimise bias from non-response.

Selection weights have been applied to HSE samples to correct for the probability of selection in two situations:
- If there were multiple dwelling units or households at a selected address, in which case only one was selected at random
- If there were more than two children at the selected address, in which case two were selected at random.

From 2003 a non-response adjustment was also incorporated into the weighting strategy. Both selection and non-response weights were applied to HSE 2012 data.
Because of sample attrition at different stages of the survey, five further separate weights have been calculated for data from the nurse visit, the blood, urine and saliva samples and the gambling questions.

Further detail about how the weights were calculated and combined can be found in Volume 2 of the 2012 report, Methods and documentation, Section 7: www.hscic.gov.uk/pubs/hse2012

Note that the complex survey design, and the method of weighting the data, mean that analysis and statistical tests for significance should be done in a package which takes the complex survey design into account, e.g. STATA or SPSS 15 or later versions.

3.2 Selecting the appropriate weight

Six different weights have been provided, for data from different stages of the survey:
- Interview stage
- Gambling module in self-completion (adults only)
- Nurse visit
- Urine sample (adults only)
- Saliva sample (children only)
- Blood sample (adults only)

If questions from different stages of the survey are combined in analysis, the weights for the latest stage of the survey should be used (that is, the latest in the list above). For instance, if blood sample results are being cross-tabulated with questions from the interview stage, the blood sample weight should be used; or if waist circumference results (from the nurse visit) are cross-tabulated with BMI data from the interview, the nurse visit weight should be used.

For further information on weighting see Section 3.1 Weighting the data.

3.3 Weighted data in the report

All 2012 data in the report are weighted, apart from the response tables. Both weighted and unweighted bases are given in tables in the 2012 report. The weighted numbers show the relative size of each group in the population. The unweighted bases show the actual number of participants in each group.

Further information about weighting data in the 2012 report can be found in Volume 2 of the 2012 report, Methods and documentation, Section 8.2: www.hscic.gov.uk/pubs/hse2012


3.4 Standard breakdowns

For most data analysis in the report, four standard analysis breakdowns have been used.

Age

Throughout the report, analyses are provided by age-group. For adults, 10-year age-groups have been used, from 25-34 upwards (with 16-24 as the youngest age group). Where numbers allow, the oldest age group reported is 85 and over. For nurse visit data, the oldest age group is 75 and over.

The age groups shown for children vary, as pragmatic decisions have been taken within each chapter to make the results as meaningful as possible. The age groups used are a compromise between providing detailed age-specific data while ensuring sufficient bases for each analysis.
Region

Analysis by region is provided throughout the report. The former Government Office Regions have been used.

Both observed and age-standardised data are provided by region in the tables. Observed data can be used to examine actual prevalence or mean values within a region. Age-standardised data are required for comparisons between regions to exclude age-related effects.

Base sizes for regions are often relatively small, and caution should be exercised in examining regional differences.

*Equivalised household income*

This measure of income takes into account the number of persons in the household. More detail of how this is derived is provided in the Volume 2 of the 2012 report, Methods and documentation, Appendix C: Glossary. www.hscic.gov.uk/pubs/hse2012

*Index of Multiple Deprivation (IMD)*

This index combines a number of indicators, chosen to cover a range of economic, social and housing issues, into a single deprivation score for each small area in England. This allows each area to be ranked relative to others according to their level of deprivation. Quintiles (fifths) of IMD are used in the tables.

For further information see Volume 2 of the 2012 report, Methods and documentation, Section 8.4: www.hscic.gov.uk/pubs/hse2012

### 3.5 Age-standardisation

Most adult tables in the report, apart from the age and sex tables, have been age-standardised. This allows comparisons between groups after adjusting for the effects of any difference in age distributions.

It should be noted that all analyses for adults in the report are presented separately for men and women. All age standardisation has been undertaken separately within each sex. When comparing data for the two sexes, it should be remembered that no standardisation has been introduced to remove the effects of the sexes’ different age distributions.

When comparing prevalence across regions by age the age-standardised values should be used. However when looking at actual prevalence within one region, the observed values should be used.

For further information see Volume 2 of the 2012 report, Methods and documentation, Section 8.3.3: www.hscic.gov.uk/pubs/hse2012

### 3.6 Design effects and true standard errors

HSE 2012 used a complex survey and weighting design. One of the effects of this is that the standard errors for the survey estimates are generally higher than the standard errors that would be derived from an unweighted simple random sample of the same size.

This comparison ratio to a simple random sample of the same size is known as a design factor or “deft”. It is the factor by which the standard error of an estimate from a simple random sample has to be multiplied to give the true standard error of the complex design. True standard errors and defefts are shown for selected survey estimates presented in the topic chapters in Tables 15-25 in Volume 2. These have been calculated using a Taylor Series expansion method. For further information see Volume 2 of the 2012 report, Methods and documentation, Section 8.5: www.hscic.gov.uk/pubs/hse2012

### 3.7 Significance testing

Significance testing is carried out on the results in the 2012 report. The term ‘significant’ refers to statistical significance at the 95% level and is not intended to imply substantive
importance. A p-value is the probability of the observed result occurring due to chance alone. A p-value of less than 5% is conventionally taken to indicate a statistically significant result (p<0.05). It should be noted that the p-value is dependent on the sample size, so that with large samples differences or associations which are very small may still be statistically significant.

The significance tests are carried out in a cross tabulation, normally a variable nested within sex, cross-tabulated with a breakdown such as age, income or region. The test is for difference for the main effects only (using a Wald test), looking at the outcome measure across the categories/subgroups. It does not test whether the difference between each or any subgroup (e.g. the highest and lowest subgroups) may be statistically significant; and with a large number of subgroups, as in a variable like region, there will usually be some significant differences between the subgroups in the survey by chance, even if in reality there are no actual differences in the population.

Using this method of statistical testing, differences which are significant at the 5% level indicate that there is sufficient evidence in the data to suggest that the differences in the sample reflect a true difference in the population.

3.8 Table conventions

For further information about the table conventions see Volume 2 of the 2012 report, Methods and documentation, Notes (p.9) and notes at the beginning of the tables section in each chapter: www.hscic.gov.uk/pubs/hse2012

4 Biological samples

4.1 Sample analytes

Blood samples were tested for total and HDL cholesterol and glycated haemoglobin (HbA1c). Urine samples were tested for sodium, potassium and creatinine. Saliva samples were tested for cotinine, a derivative of nicotine.

4.2 Quality control of blood, urine and saliva analytes

The overall conclusion for the data provided in the 2012 report is that methods and equipment used for the measurement of blood, urine and saliva analytes produced internal quality control (IQC) and external quality assessment (EQA) results within expected limits. The results of the analyses for each of the main blood and urine analytes and saliva cotinine levels were acceptable for the HSE 2012.

For details of procedures used in the collection, processing and transportation of the biological specimens see Volume 2 of the 2012 report, Methods and documentation, Section 9 and Appendix B: www.hscic.gov.uk/pubs/hse2012

4.3 Internal Quality Control (IQC)

Internal quality controls help identify and prevent the release of any errors in an analytical run, as well as being used to monitor trends over time.

For each analyte or group of analytes, the laboratory obtains a supply of quality control materials. The results obtained by the laboratory are evaluated from replicate measurements (over several runs) in conjunction with target values provided by manufacturers of IQC materials, if available. IQC values are assessed against an acceptable range and samples are re-analysed if they do not meet the acceptable range.

For further information on IQC see Volume 2 of the 2012 report, Methods and documentation, Section 9.3, and Tables 27-34: www.hscic.gov.uk/pubs/hse2012
4.4 External Quality Assessment (EQA)

EQAs allow the comparison of results between laboratories measuring the same analyte. An EQA scheme for an analyte or group of analytes distributes aliquots (sub-samples) of the same sample to participating laboratories, which are blind to the concentration of the sample received. This process is repeated with multiple samples over the course of a year. Results are returned to the scheme organisers, who provide a laboratory-specific report including the mean values, measures of between-laboratory precision and the bias of the results obtained by that laboratory.

EQA is a retrospective process of assessment of performance, especially of inaccuracy or bias related to mean values. Unlike IQC it does not provide control of release of results at the time of analysis.

For further information see Volume 2 of the 2012 report, Methods and documentation, Section 9.4 and Tables 35-40: www.hscic.gov.uk/pubs/hse2012
NatCen Social Research
www.natcen.ac.uk

NatCen Social Research is the largest independent social research institute in Britain, carrying out research that works for society. NatCen specialises in research in public policy fields such as health and well-being, society and social change, children and young people, income and work, crime and justice. We offer the full range of quantitative and qualitative research services. Our team includes survey methodologists, data analysts and policy sector specialists. As well as research staff, NatCen has a national panel of over 1,000 interviewers and 150 nurses who work on health-related surveys.

Research Department of Epidemiology and Public Health, UCL (University College London)
www.ucl.ac.uk/epidemiology

The Research Department of Epidemiology and Public Health, chaired by Professor Richard Watt, is a leading centre for research into the social determinants of health, and has a strong interdisciplinary structure. The Department houses 180 staff in 11 main research groups, including the Joint Health Surveys Unit, part of the Health and Social Surveys Research Group (HSSRG). The HSSRG studies population health (including health behaviours and treatments) and inequalities in health. Much of the group’s research is carried out using large population surveys that collect data on health, economic and social issues, using a variety of survey methods and statistical techniques, while qualitative methods are also used by the group. The group is multidisciplinary, with epidemiology, sociology, statistics, public health nutrition, demography and geography all represented.

The Joint Health Surveys Unit has been created by NatCen Social Research and the Health and Social Surveys Research Group within the Research Department of Epidemiology and Public Health at UCL. The JHSU enables collaborative working, combining the strengths and talents of each organisation, to carry out major health surveys such as the Health Survey for England.