Scottish Care Experience Survey Programme

Health & Care Experience Survey 2017

Review of Weighting Methodology

1. Introduction

When conducting a survey, it is important to have a representative sample of the population you are interested in to reduce bias in the estimates produced. Applying weighting methods reduces the potential bias by making the results more representative of the population but also increases the variation in the estimates.

Survey weights are numbers associated with the responses that specify the influence the various observations should have in the analysis. The final survey weight can be thought of as a measure of the number of population units represented by the response.

Four Health & Care Experience (HACE) Surveys have been run with results published between 2009 and 2016. These surveys have all used the same weighting methodology which is described in Section 2.

Feedback from a UK Statistics Authority[1] (UKSA) review of these publications has provided the opportunity to review the weighting methodology employed by this survey. The questionnaire has also gone under significant review in advance of the 2017 survey which means this is an ideal time to review and update the weighting methodology that is used.

2. Existing Methodology[2]

2.1 Sampling

A random sample is taken from a database of all those who are 17 and over and are registered with a GP Practice in Scotland on a set date. A small number of special practices, run by NHS Boards to provide primary care services to particular, small groups of patients (for example, practices for homeless people) were excluded from the survey. Patients who had requested not to be included in this or other surveys were removed from the sampling frame.

Sampling was done within GP Practice lists to aim for sufficient responses to achieve a reasonably reliable result for each practice. For some practices with very small numbers of eligible patients, all patients were included in the survey in order to meet the minimum sample size requirements identified.

More details on the sampling methodology used can be found in the individual technical reports for each survey, available at www.gov.scot/GPSurvey.

[1] https://www.statisticsauthority.gov.uk/

[2] HACE 2015/16 Technical Report (http://www.gov.scot/Resource/0050/00500333.pdf)

2.2 Weighting

Results at Scotland, NHS Board and Health and Social Care Partnership level are weighted in order to account for the unequal probability of selection. Results at GP Practice level are presented unweighted.

Weighted results were calculated by first weighting each GP Practice result for each question by the relative practice size. The weighted practice results were then added together to give an overall weighted percentage at Scotland, NHS Board and Health and Social Care Partnership level.

The weight for each practice is calculated as the practice patient list size (of patients aged 17 or over and therefore eligible for being included in the sample survey) as a proportion of the entire population (Scotland, NHS Board or Health and Social Care Partnership) of patients eligible for inclusion in the survey. Weighting the results in this way provides results more representative of the population (at Scotland, NHS Board or Health and Social Care Partnership level) than would be the case if all practices (small and large) were given equal weighting in the calculation of aggregation results.

3. Issues with Existing Methodology

Upon reviewing the existing weighting methodology and considering its rationale and appropriateness, a number of potential drawbacks were identified:

1. Variations analysis that has been carried out on the 2011/12 results shows that there were four characteristics that had a strong effect on people's experiences:
    - GP practice registered with – considerable variation between practices.
    - Size of GP practice – better experiences reported at smaller practices.
    - Age – older people reported better experiences.
    - Health status – people with better health status reported better experiences.

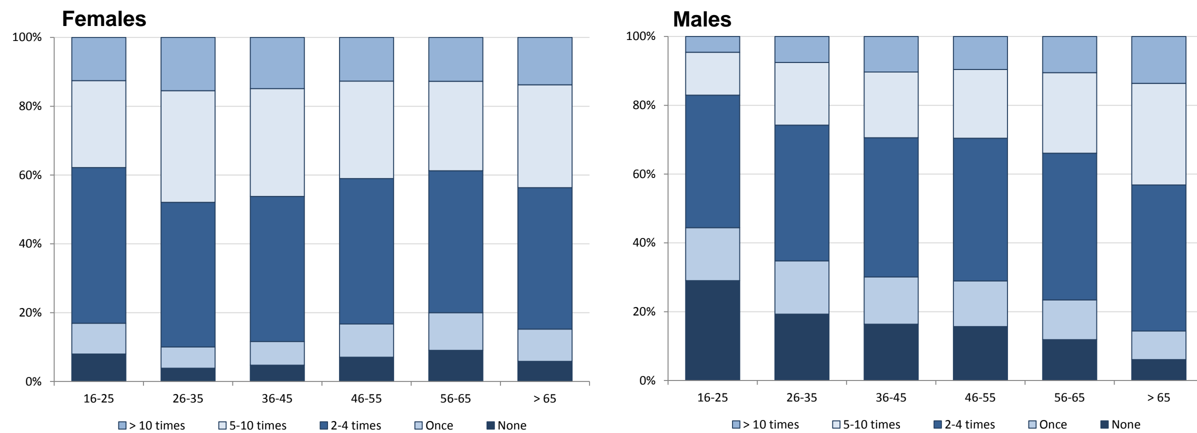
    Of these, the current weighting methodology **only accounts for variation in experience based on the size of the GP practice**.

2. As the **weights are calculated individually for each question**, it makes it complicated and arduous for others to replicate.

3. The existing weighting methodology **weights up to the entire population of patients eligible for inclusion in the survey**. This means we are attributing weight to those who may not have experienced the service in question (such as those who have not contacted their GP practice in the last 12 months).

    Analysis of the number of visits to the GP in the last twelve months (including those reporting zero visits) also shows a clear difference between men and women, as can be seen in Chart 1. Most notably, younger men are much less likely to have visited their GP in the last 12 months.

Chart 1: Comparison of number of GP visits in the last 12 months by age group and gender, HACE 2015-16



Feedback from GP Practices has also highlighted that the survey responses aren't representative of their practice population.

4. Review of Current Methodology

The review was carried out jointly between analytical colleagues in Scottish Government (SG) and Information Services Division (ISD, NHS Scotland).

A range of weighting techniques, including weighting for unequal probability of selection, weighting for unequal response rates and trimming, were looked at. It was considered whether they were relevant to HACE and, if so, how they could be applied in practice.

A review of the weighting strategies used in other surveys, including other patient experience and SG surveys, was also carried out.

5. Recommendation

The following weighting strategy is proposed for the HACE 2017 survey:

One weight will be calculated for each section of the questionnaire (rather than one weight per question). Whilst many surveys have one overall weight, that does not seem appropriate for this survey as the groups of respondents to each section could potentially vary significantly (e.g. the difference between respondents to the GP section and respondents to the Social Care section). However, those responding to questions **within** the GP section should remain relatively consistent and so having one consistent weight across this section would be more appropriate.

The weight for each section will be calculated in two steps:

1. **Weight for unequal probability of selection** by weighting respondents up to the total population in each GP practice as is currently done.
2. **Weight for non-response** by weighting up to the entire population experiencing the service based on **age**, **gender** and **use of service** (based on survey responses indicating whether the service has been experienced). The population total for those experiencing the service will have to be an estimate based on survey responses and it is recommended that they be based on the proportions from HACE 2017 applied at a national level for all levels of reporting.

HACE results are published at National, Health Board, Health & Social Care Partnership, Locality, GP Cluster and GP Practice levels. The weighting strategy proposed here should be applied to all levels with the following adjustments:

- **HB/HSCP Level** – As described but with a reduced number of age categories to ensure there are no categories with no respondents at this level.
- **GP Cluster/Locality Level** – As described but excluding age to ensure there are no categories with no respondents at this level. Age was selected as it is likely to have the least significant impact on experience of the three characteristics and is likely to be loosely linked to use of service.
- **GP Practice Level** – As GP Practice was the sample strata used, there is no need to calculate a weight for unequal probability of selection. Instead, the weights at this level should just equal the weight for non-response as described for GP Cluster level. If there are any categories with no respondents using only gender and use of service, then weighted results should not be provided to that GP Practice for the relevant section.

Trimming will be applied such that the maximum weight is calculated as:

$$\text{Mean} + (x * \text{Standard Deviation})$$

where x is an integer such that less than 5% of respondents have their weight trimmed for each reporting level.

6. Impacts of Recommendation

The recommended weighting methodology described in Section 5 will be applied to the 2017 HACE results. The results will be available in April 2018 via a national report and an interactive dashboard at www.gov.scot/GPSurvey.

The change in methodology is expected to have a small impact on the national results. The impact on lower level results is likely to be larger given the reduced sample size. Time series figures will be backdated where appropriate to ensure comparisons over time are available.

Health & Social Care Analysis
November 2017