

**NHS Patient Survey Programme**

**2017 Adult Inpatient  
Survey:  
Quality and Methodology  
Report**

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# Introduction

This report provides detailed information on key quality and methodological issues relating to the 2017 Adult Inpatient Survey. It covers the development, implementation and analysis of the survey, as well as the quality of the data and any points that should be noted when using the outputs. More details on the development of the survey and errors made during the sampling process can also be found here: <http://www.nhssurveys.org/surveys/1084>

The Adult Inpatient Survey is the longest running survey in the NHS Patient Survey Programme (NPSP). The Coordination Centre, based at Picker, manages and coordinates the programme at national level, on behalf of the Care Quality Commission (CQC).

The survey is run on an annual basis since 2004, with all NHS acute hospital trusts in England participating. The 2017 survey is the fifteenth iteration since the inception of the NPSP in 2002, and was concerned with inpatients who were discharged from an NHS England trust during July 2017. Each trust selected a sample of 1,250 patients, by including every consecutive discharge counting back from 31st July 2017; with smaller trusts sampling as far back as January 2017, as required. In total, 148 NHS England trusts partook in the survey, with more than 72,778 questionnaires being successfully completed by patients; a response rate of 41%

An overview of our approach to quality within the NPSP is available in the 'NHS Patient Survey Programme: Quality Statement' document, available here: [http://www.cqc.org.uk/sites/default/files/20151125\\_nhspatientsurveys\\_quality\\_statement.pdf](http://www.cqc.org.uk/sites/default/files/20151125_nhspatientsurveys_quality_statement.pdf)

# Survey development

## Survey design and implementation

The NPSP adopts general principles of good survey practice. The programme has implemented a number of measures to help maximise response rates, including:

- Development of survey questions that are relevant to all, or most, people in the sample.
- Questionnaires written using simple and clear language.
- Use of cognitive interviewing to test questions and response options with people who have recently used NHS services, in order to ensure that they are easily understood and relevant.
- Reassurances of anonymity and confidentiality.
- Sending up to two reminders to nonrespondents.
- Long fieldwork periods to encourage lesser-heard groups, such as minority ethnic groups, to respond.
- A Freephone language line providing translation services.
- Contact details for Mencap which offers support for people with learning difficulties.
- Use of a Quality Assurance Framework ensuring all survey materials and results are reliable and accurate.

Like most surveys in the NPSP, the Adult Inpatient Survey uses a postal survey mode whereby a questionnaire is sent to patients' resident addresses. This aims to reduce the effects of social desirability bias, which can arise when people give feedback either directly to staff, or while on trust premises.

A number of steps are taken to ensure the quality of the survey design and implementation. As with all surveys in the programme, an advisory group is consulted to ensure that a range of internal and external stakeholders are given the opportunity to provide input during survey development. The advisory group includes representatives from CQC, NHS England, NHS Improvement, NHS trusts and the Department of Health. Questionnaires are also cognitively tested with recent service users, as described in the 'Questionnaire development' section below.

Further information about these methodological changes can be found in the survey development report: <http://www.nhssurveys.org/survey/2008>

The Adult Inpatient Survey follows a strict methodology, as specified in the survey specific instruction manual which all trusts (or the contractors they appoint to run the survey on their behalf) must follow (see <http://www.nhssurveys.org/surveys/1078>). Any deviation from the survey instructions, depending on severity, may result in data being excluded from published results. Any decision to exclude data is made by the Surveys Team at CQC in conjunction with the Survey Coordination Centre, based on discussion with, and evidence provided by, the trust(s). No trusts were excluded from the 2017 Inpatient Survey publication. However, twenty seven trusts experienced a questionnaire error which has resulted in the suppression of their results for two questions: Q55 and Q61.

## Questionnaire development

Following consultations with key stakeholders and analysis of the 2016 survey results, nine new questions were added to the 2017 questionnaire, two existing questions were amended, and

thirteen questions were removed. This included the redevelopment of the questions around Long Term Conditions.

Prior to fieldwork, the re-developed questionnaire was cognitively tested with 18 volunteers who had stayed in hospital for one or more nights in the previous six months. Respondents completed a questionnaire with a researcher to check that the questions and responses options were appropriate and were being understood as intended. The testing took place across Oxford and surrounding areas, and volunteers of mixed ages, ethnic groups and gender took part. Interviews were carried out in three rounds, with alterations made to certain questions between rounds in accordance with feedback from participants and stakeholders.

For more information about the cognitive testing process and amendments made to the 2017 survey please see the survey development report at: <http://www.nhssurveys.org/survey/2008>.

# Sampling and fieldwork

## Sampling

All trusts that provide adult inpatient services were eligible to take part in the survey. In total, 148 trusts participated in the 2017 survey.

Patients were eligible for the survey if they had spent at least one night in hospital and had been discharged during July 2017, and were aged 16 years and over. Trusts with fewer than 1250 eligible discharges in July (working backwards from 31<sup>st</sup> July) were required to sample backwards into earlier months to reach the required sample size. Three trusts within the survey, all specialist acute trusts, had to sample back to 1<sup>st</sup> January 2017 to draw a sample. These trusts did not meet the required 1250 sample size for the survey but had sufficient numbers of patients over the sampling period (> 600 patients) to be included. Trusts were required to compile their sample according to strict eligibility criteria excluding the following groups as follows:

- Deceased patients.
- Children or young persons under 16 years old at the time of sampling.
- Obstetrics/maternity service users, including spontaneous miscarriages.
- Patients admitted for planned termination of pregnancy.
- Psychiatry patients.
- Day case patients; those patients who arrived and left on the same day.
- Private patients (non-NHS).
- NHS patients treated at private hospitals.
- Any patients known to be current inpatients.
- Patients without a UK postal address. Although, patients were not excluded if addresses are incomplete but useable; i.e. missing a postcode.
- Any patient known to have requested their details are not used for any purpose other than their clinical care.

Fieldwork for the survey (the time during which questionnaires were sent out and returned) took place between August 2017 and January 2018. Further information about the sampling process is available in the sampling handbook here: <http://www.nhssurveys.org/survey/1990>.

## Sampling error

The sample size for the Adult Inpatient Survey was 1250 discharged patients per trust; of which there are 148. Assuming the sample period is not atypical, the large sample for the 2017 survey sample can be considered representative of all eligible inpatients in England.

## Trust mergers

The results for England are based on an average of the pooled results from all participating trusts. Changes in the number of participating trusts have a very small effect on the results for England. However, when reporting individual trust results it would be inaccurate to display historical data if a trust has undergone a merger since the previous survey which makes trust's results incomparable with previous years'.

There was one trust merger in 2017: Hinchingsbrooke Health Care NHS Trust (RQQ) and Peterborough and Stamford NHS Foundation (RGN) merged to form North West Anglia NHS

Foundation Trust (RGN). As such, this merged trust did not receive historical comparisons in 2017. There was also a merger between Birmingham Women's and Birmingham Children's NHS Foundation Trusts, but as there was no change in the trusts eligible population as there was no change to service delivery lines, comparisons to results from previous years were still able to be made.

## Errors in drawing samples

The chances of sampling mistakes being made by trusts (for example, excluding certain eligible women) are minimised by multi-stage sample checks. Firstly, trusts are provided with a checklist to review their sample. Trusts that appoint an approved contractor<sup>1</sup> to undertake the survey on their behalf will then have their sample reviewed by their contractor. Finally, all anonymised samples are checked by the Coordination Centre which looks for errors that are more noticeable when pooling data together, such as unusual or skewed age distributions.

During the Coordination Centre's sample checking process, several items are checked against the previous year's submission to help ascertain whether a trust has followed the guidelines correctly. These include comparisons of demographics such as age, ethnicity, route of admission, discharge rates, discharge sites and treatment function codes. If there are any concerning discrepancies, queries will be raised with the contractor working on behalf of the trust or, in the case of in-house trusts, with the trust directly.

Errors identified from these checks are classified as either minor or major. A minor error is defined as a mistake that will not affect the usage or quality of the survey response data. One example of a minor error is applying patient record numbers in an incorrect format. Minor errors can be rectified by the trust, contractor or the Coordination Centre as appropriate, without the need for the sample to be redrawn or patients to be added or replaced.

A major error is defined as an error that will affect the usage or quality of the response data. An example of this type of error is the exclusion of a particular hospital site or patients with a particular route of admission to hospital, which potentially creates bias in the sample. If a major error is spotted during sample checking, the trust is required to totally redraw their sample or add/remove patients as appropriate.

A sampling errors report is produced each year and is published on the NHS surveys website. Trusts and approved contractors are encouraged to review this report to minimise the recurrence of previously detected errors. As detailed in the 2017 report there were 9 major errors and 14 minor errors identified in samples submitted to the Coordination Centre for this survey (see <http://www.nhssurveys.org/surveys/1102>).

A sample declaration form, which trusts must complete prior to submitting their sample, is used to help further reduce sampling errors. This form outlines a number of required checks to ensure that the sampling instructions have been followed. It also helps to confirm that trusts have maintained patient confidentiality by taking the steps laid out in the instruction manual, such as only sharing the required variables. Approval of this form by the trust's Caldicott Guardian prior to data submission not only fulfils the trust's requirements under the Data Protection Act (the data protection legislation which the 2017 Adult Inpatient Survey was subject to), but also reduces the potential for breaches to the support received under Section 251 of the NHS Act 2006.

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<sup>1</sup> These are companies that have been approved by the CQC during a competitive tendering process to carry out surveys in the NHS Patient Survey Programme on behalf of trusts. For more information please see: <http://www.nhssurveys.org/approvedcontractors>

We have explored the way in which trusts input data for patients before it is used to create survey samples, in order to identify the level of risk for error at that stage. This is outlined in the Statement of Administrative Sources, available on the CQC website [here](#). It was concluded that, although the potential does exist for inaccurate addresses or coding of cases at this stage, this is unlikely to occur due to the data quality requirements placed upon NHS trusts. As a result, the chances of such errors occurring at this stage are small enough that any impact on trust results is likely to be minimal, and in turn, would have an even smaller impact on the aggregated results for England.

## Historical sampling errors and excluded trusts

Part of the Coordination Centre's sample checking process involves comparing a trust's sample data to their samples from previous iterations of the survey and investigating any discrepancies. This can sometimes reveal errors in samples from previous years, which only become apparent when comparing with the current year's sample<sup>2</sup>. If these are classified as major errors, historical comparisons between the current and previous years may not be possible for the trust in question.

The Coordination Centre checked each trust's 2017 sample against their 2016 (and sometimes 2015) sample. Whilst a number of investigations were undertaken to understand where possible sampling errors had occurred in previous survey years, no trusts were excluded as a result of these investigations. Historical comparisons were provided for all trusts. In addition, no trusts were excluded from the survey as a result of sampling errors in 2017.

For more information about the historical errors identified in the 2017 survey please see the sampling errors report at: <http://nhssurveys.org/survey/2130>

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<sup>2</sup> Whilst the Coordination Centre undertake robust checks on the sample, it is not always possible to identify all sampling errors from the sample declaration form and anonymised sample file. Therefore some errors are identified retrospectively when checking the current year's data. It remains the responsibility of trusts to ensure samples are drawn correctly and that all inclusion and exclusion criteria have been correctly applied.



# Data analysis and reporting

## Data cleaning and editing

Survey data from each participating trust - whether conducting the survey themselves in-house or using an approved contractor<sup>3</sup> - are submitted to the Coordination Centre for cleaning. During fieldwork, a data cleaning manual covering the cleaning that the Coordination Centre undertakes is published (see <http://www.nhssurveys.org/survey/1999>). This document allows participating trusts and contractors to understand the Coordination Centre's cleaning processes. However, trusts and contractors are required to submit raw data (ie: uncleaned data) to the Coordination Centre at fieldwork close. Data are submitted to the Coordination Centre in Excel although the final dataset for the survey is in SPSS. A version of this data is available for secondary data users at the UK Data Service (UKDS).

There are a number of standard checks undertaken on the data. These include checking that:

- Hard copies of questionnaires from contractors and in-house trusts are correct, i.e. questions, response options, routing and instructions are as they should be.
- The number of rows of data (i.e. the number of patients) is as expected.
- The variable, question and response option wording matches the questionnaire.
- There are no out-of-range values in either sample or response data.
- Routing has been followed correctly, i.e. respondents have not answered a question that does not apply to them.
- All response coding falls within the expected range of response options for a question.
- Response data reflect the sample data, e.g. year of birth in the sample data matches the year of birth reported by the respondent.
- Only eligible patients were included in the survey.

The data are also checked for a number of other, more in-depth, errors. This includes looking at questionnaire item non-response, which can indicate if a question is not necessarily being understood in the way it has been designed. In addition, high levels of missing data on suites of questions that are positioned next to each other can indicate an issue with page turnover.

When data are suppressed for a question, which occurs when there are fewer than 30 responses for a trust, this is cross-referenced against the raw Excel data submitted by a trust to confirm that the suppression was correctly applied. When a trust has a low response rate, the data are also checked against the sample for representativeness (in terms of demographics), in order to determine whether the data should be included. There were no exclusions made for the 2017 data due to representativeness concerns.

When errors are found, trusts or contractors are asked to re-submit the data with corrections made. In 2017, no re-submissions were required.

## Statistical release

A statistical release has been published which provides full descriptive analysis England-level results for the 2017 survey compared against previous survey years and a multi-level analysis of subgroups. This is published on the CQC website here:

<http://www.cqc.org.uk/publications/surveys/adult-inpatient-survey-2017>.

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<sup>3</sup> In 2017, five trusts chose to conduct the survey in-house, not using an approved contractor.

The data are weighted in order to control for the influence individual trusts' response rates have on the England-level average<sup>4</sup>. For questions that are comparable (i.e. unchanged) across survey years, comparisons were made using z-tests to determine whether differences between years were statistically significant. For the 2017 iteration of the survey, control charts have also been produced. For each question, a chart displaying the trend data from 2009 to 2017 has been included. For questions evaluating care, the chart is a 'p-chart' and these plot the percentage of the most positive responses to a question (top box) and show the 'expected limits' of variation in survey results under the hypothesis is that there has been no change in reality. The upper and lower limits show the boundaries outside of which year-on-year change is considered 'notable', meaning that the degree of change is greater than the standard variation you would expect to see around results year-on-year given that there has been no underlying change. When changes fall outside of the expected limits, it suggests an underlying phenomenon at play or there has been a change in behaviour. However, an isolated point outside the limits may not indicate any underlying shift.

The multi-level analysis of subgroups highlights the experiences of different demographic sub-populations. Results for each demographic subgroup are generated as adjusted means (also known as estimated marginal means or population marginal means) using a linear mixed effects model. These means are compared within themes, derived from composites of results from specific questions. This model takes into account trust-level effects, as trusts are likely to have an effect on reported patient experience at an England-level.

To assess whether experiences differ by demographic factors, F-tests were performed on each factor (fixed effect) as a predictor of the target variable. P-values were generated to show the likelihood of the observed differences between groups arising from a population where no actual differences occur. They relate to the demographic factor as a whole rather than to comparisons between specific categories within the factor. Predictor variables were checked for multicollinearity to ensure coefficients could be accurately estimated.

Differences of at least 0.1 standard deviations from the overall mean of the target variable are treated as being noteworthy.

For the 2017 survey the following demographic subgroups were analysed:

- Gender
- Age
- Ethnicity
- Religion
- Sexual orientation
- Long-term health conditions
- ICD 10 chapter code
- Route of admission
- Length of stay
- Medical versus surgical
- Patient versus proxy respondent

The themes of patient-centred care against which these subgroups were compared are as follows:

- Information, communication and education: Q30, Q36, Q56, Q64

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<sup>4</sup> More information on the weighting approach applied to the data can be found in the 'Addressing non-response bias in the survey results' section of this report.

- Respect for patient-centred values, preferences and expressed needs: Q23, Q26, Q34, Q39, Q48
- Emotional support: Q37, Q38
- Confidence and Trust: Q24, Q27, Q35
- Coordination and integration of care: Q32, Q54, Q62, Q66
- Individual questions: Q20, Q22, Q67, Q68

## Trust results

Analysis is conducted on the data at trust level to allow comparisons to be drawn between the performances of different trusts for individual questions in the survey. The method for this analysis is detailed in the technical document here: <http://www.cqc.org.uk/publications/surveys/adult-inpatient-survey-2017>.

The results of this analysis are published in benchmark reports for each individual trust, available here: <http://www.nhssurveys.org/surveys/1225>. One type of benchmark report is produced, covering all sections of the questionnaire.

For questions evaluating care, each response option is assigned a score (from 0-10), and composite section scores are then produced by grouping similar questions together. Demographic questions, non-specific responses, some routing questions and other questions that do not evaluate a trust's performance are not scored. A scored version of the questionnaire can be found here: <http://www.nhssurveys.org/surveys/1107>.

A trust's question score is calculated by taking the weighted average of responses for the trust, for the given question. A chart is produced for each scored question and each section of the questionnaire, unless a question has fewer than 30 responses<sup>5</sup>. These charts show the overall range of trusts' scores for a question, broken down into three parts (where a black diamond indicates the score of the trust in question):

- If the black diamond lies in the orange section of the graph, the trust result is 'worse' than expected when compared with most other trusts in the survey.
- If the black diamond lies in the green section of the graph, the trust result is 'better' than expected when compared with most other trusts in the survey.
- If the black diamond lies in the grey section of the graph, the trust result is 'about the same' when compared with most other trusts in the survey.



Tables are also produced for the benchmark reports, giving the trust's score, the range of scores for each section and question, and the number of responses to each question.

Historical comparisons are made, where possible, against the 2016 survey. Arrows next to comparable questions indicate where the 2017 score is significantly higher or lower than the 2016 score. No arrow reflects no statistically significant change.

<sup>5</sup> If a question has fewer than 30 responses for a given trust, the confidence interval around the trust's question score is considered too large to be meaningful and results are not reported. Additionally, for any such question, the trust is excluded from England averages and is not given a section score.

## NHS England National Statistics for England

This year nineteen questions from the 2017 survey contribute to Overall Patient Experience Scores (OPES) as outlined by NHS England (Q6, Q7, Q9, Q14, Q15, Q16, Q19, Q23, Q25, Q26, Q28, Q33, Q34, Q40, Q42, Q51, Q57, Q58 and Q67)<sup>6</sup>. The domain names included in OPES are the following:

- Access and waiting
- Safe, high quality, co-ordinated care
- Better information, more choice
- Building closer relationships
- Clean, friendly, comfortable place to be

More information is available at: <http://www.england.nhs.uk/statistics/statistical-work-areas/pat-exp/>.

## Quality assurance

### Approved contractor / in house trust checks

Each contractor and in-house trust undertakes a series of checks at key stages of the survey, especially the sample preparation and data cleaning stages. These checks are to identify any obvious errors in the sample and response data, such as inclusion of ineligible patients or incorrect coding. Validation checks are also undertaken on mailing information in order to determine whether the patient's address is complete enough for a survey to be sent.

### Coordination Centre checks

There are a number of quality assurance (QA) checks undertaken by the Coordination Centre at various stages of the survey. The first QA checks are on the sample files submitted by either contractors or in-house trusts. These checks help to determine whether there are any errors in the sample file, such as the exclusion of eligible patients.

The Coordination Centre also checks hard copies of the covering letters and questionnaire used by in-house trusts and contractors. This can help to identify if any errors have been introduced when the survey documents are reproduced. Errors are usually typographical in nature, such as misspelt or missing words, improper use of boldening (which is normally used to highlight key words for cognition reasons), and misworded or missing response options. If an error is identified that would compromise the data collected, the Coordination Centre asks the contractor or in-house trust to rectify the error and resubmit their hard copies. However, if mailings have already commenced, the data for the question containing the error would be excluded from the final dataset and outputs for the affected trusts. If mailings have already commenced then the Coordination Centre will undertake investigatory analysis to determine the impact of the error on the response data such as identifying any response bias with regards to demography or patterns of response (for example, certain groups responding differently to questions as a result of the errors introduced).

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<sup>6</sup> Due to a questionnaire error this year affecting a number of trusts, Q61 has been removed from OPES for 2017 only.

During the checks undertaken on the hard copies of questionnaires, it became apparent that errors affecting some of the routing questions were present in the questionnaire mailed out by one contractor. This affected twenty seven trusts in total. Investigations were undertaken by the Coordination Centre to determine the impact on the data as a result of these routing errors and a decision taken, in agreement with CQC, to exclude data for these twenty seven trusts for two questions only: Q55 and Q61. The investigations demonstrated that due to the errors, a level of bias had been introduced into the data for these trusts which undermined the quality of the data collected for those two specific questions.

During fieldwork the Coordination Centre monitors the weekly progress of the mailings and response rates both at England and trust-level. This is important because low response rates can limit the representativeness, and therefore usability, of the data. In addition, the survey needs to be administered using a standardised approach with a set number of mailings during fieldwork, and a particular deadline for the final mailing. This is to allow groups that tend to respond late in surveys to have sufficient time to respond. If any concerns about the progress of the survey are identified, the Coordination Centre will investigate the reasons for this. Four trusts experienced delays in submitting their sample data for approval by the Coordination Centre which impacted their entry into fieldwork. These trusts had a total fieldwork period of 5-6 weeks. On submission of the data for these trusts, at fieldwork close, the Coordination Centre undertook analysis to determine whether the shorter fieldwork period impacted the quality of the data collected. Whilst the four trusts in question had lower response rates than other trusts participating in the survey, the demography of the responding profile was in line with the overall population demography and there were no significant differences compared to those who had not responded. As a result, the data for these four trusts was included in the 2017 survey.

The final set of QA checks undertaken by the Coordination Centre focuses on the response data and analysis. In addition to the specific checks of the survey data, as outlined in the 'Data cleaning and editing' section above, each stage of the data cleaning is second-checked internally.

All analysis outputs based on the data (such as the trust-level results and England-level reporting) go through a two-stage quality assurance process, checked by both the Coordination Centre and CQC.

## Data limitations

### Context

As with any survey, statistical analysis of data from the Adult Inpatient Survey is susceptible to various types of error from different sources. Potential sources of error are carefully controlled through development work in terms of questionnaire design and sampling strategy, which is in turn supported by extensive quality assurance at every stage of the survey.

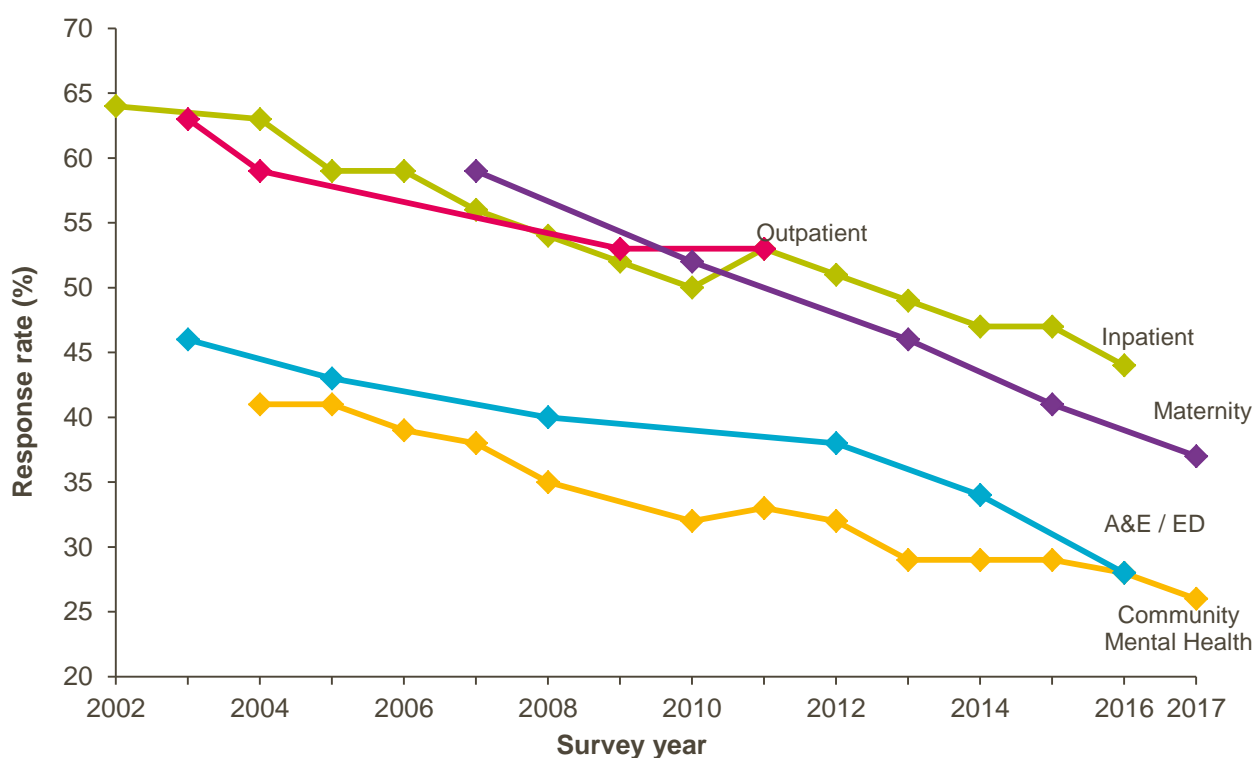
### Seasonal effects

Participating NHS Trusts selected inpatients who had a stay of at least one night during the month of July 2017, starting from 31st July 2017 and working backwards. Although smaller trusts were allowed to sample back to 1st January 2017, if necessary, the vast majority of patients included in the 2017 Adult Inpatient Survey received treatment in July 2017. It is therefore possible that there may be some seasonal effects on responses; if staffing levels and other factors differ throughout the year, for example. However, given that the sampling period is the same for all trusts taking part

in the survey and that the Adult Inpatient Survey has historically been sampled during the summer months, any such seasonal variation would not affect the comparability of the results or its use in assessing the performance of trusts.

## Response rates

Response rates for the Inpatient survey have dropped since it was first launched, from 64% in 2002 to 41% in 2017. This is consistent with other surveys in the NPSP and with industry-wide trends in social and market survey research. Figure 1 below illustrates response rate trends for the more established surveys in the NPSP<sup>7</sup>. As shown, there is a clear downwards trend across all surveys.



**Figure 1:** Response rates for established surveys in the NPSP

The Coordination Centre conducts pilot work to test different approaches aimed at increasing response rates. For example, four interventions were piloted alongside the 2017 Community Mental Health Survey, with results indicating that redesigned covering letters and a redesigned questionnaire were most effective at increasing response rates for particular sub patient groups such as younger people. The Coordination Centre, with the agreement of CQC, has previously made changes across the survey programme as a whole on the basis of similar pilots.

<sup>7</sup> Please note that not all surveys are carried out annually.

## Non-response bias

One of the main issues that can affect survey results is nonresponse bias, and as response rates for surveys decline, the risk of non-response bias increases. Nonresponse bias refers to the outcome that those who chose to respond to the survey are different from those who chose not to respond. This type of bias would arise, for example, if patients with more positive views of their care were to be more likely to respond than those with negative views. However, whether non-response bias is present is difficult to assess, as we do not have any way of knowing how those people who did not respond would have answered.

A further issue is that we cannot always differentiate between those who did not receive a questionnaire and hence could not respond (noncontact) versus those who received a questionnaire but chose not to respond (nonresponse). The number of questionnaires that are returned undelivered is logged during the course of the survey. However, there may be another group of patients who, for example, changed address but did not inform the trust, and therefore did not receive a questionnaire. It is not possible to know how large this group is.

Furthermore, patient confidentiality prevents the Coordination Centre from assessing the data quality of the samples that were drawn, as they do not have access to the name and address details of those in the sample population.

Research, including work carried out as part of the NPSP, has shown that certain groups are consistently less likely to respond, including young people, males, black and minority ethnic groups (BAME), people from London or deprived areas, those with a mental health condition or poor literacy<sup>8 9 10</sup>.

Tables 1 below suggests that gender, age and ethnic group nonresponse biases exist in the Adult Inpatient Survey. Table 1 shows respondents and nonrespondents.

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<sup>8</sup> [http://www.nhssurveys.org/Filestore/documents/Increasing\\_response\\_rates\\_literature\\_review.pdf](http://www.nhssurveys.org/Filestore/documents/Increasing_response_rates_literature_review.pdf)

<sup>9</sup> [http://www.nhssurveys.org/Filestore/documents/Review\\_BMEcoverage\\_HCC\\_surveys.pdf](http://www.nhssurveys.org/Filestore/documents/Review_BMEcoverage_HCC_surveys.pdf)

<sup>10</sup>

[http://www.nhssurveys.org/Filestore/documents/Increasing\\_response\\_rates\\_stakeholder\\_consultation\\_v6.pdf](http://www.nhssurveys.org/Filestore/documents/Increasing_response_rates_stakeholder_consultation_v6.pdf)

**Table 1:** Respondents and nonrespondents to the 2017 Inpatient Survey by key demographics

Demographics	Responded (%)	
	Yes	No
<b>Age</b>		
16-35	5%	21%
36-50	8%	18%
51-65	23%	21%
66-80	42%	21%
> 80	23%	19%
<b>Gender</b>		
Male	47%	47%
Female	53%	53%
<b>Route of admission</b>		
Emergency	64%	79%
Planned	36%	21%
<b>Ethnicity</b>		
White	95%	89%
Mixed	0%	1%
Asian or Asian British	3%	5%
Black or Black British	1%	3%
Arab or other	0%	0%
Not stated or missing	1%	2%

Note: Percentages are rounded to the nearest whole number - group totals may add up to more than 100%.

Please note that Table is based on information from trust sample files<sup>11</sup> only, and will therefore differ from response rates published elsewhere which are compiled from a combination of response and sample information if a response is missing. We cannot use respondent-provided information to calculate response rates, as the corresponding information is unavailable for nonrespondents. When calculating response rates, patients who have died and anyone for whom the questionnaire was undeliverable, are removed from the base.

## Addressing potential nonresponse bias in the survey results

We have considered the application of nonresponse weighting to the survey results for both the England-level data and the trust-level results. However, in considering whether to weight for nonresponse and whether this should be according to either the sample or population data, we need to factor in the primary aim of why the survey data are being collected.

<sup>11</sup> Trust sample files contain all people selected to take part in the survey and include information such as age, treatment function code, site of admission and discharge.



For the majority of social research studies, in particular those that are cross-sectional or general population studies, non-response is weighted for against the target population demographics. This is normally achieved by weighting for key characteristics such as age, gender, marital status and socio-economic status, if this auxiliary data exist on the sampling frame. Re-weighting is used to eliminate, or at least reduce, nonresponse bias. For NHS patient surveys, the eligible population equates to the complete drawn sample. This is subdivided into weighting cells according to the demographic data recorded. The reason why weighting back to the population is key for these studies is that they are looking to make generalisations about a population as a whole rather than individual cases within it.

## **Trust-level benchmark analysis**

For the NPSP, the data collected are used for measuring and comparing the performance of individual NHS trusts. Therefore it is important that we are able to distinguish between the characteristics of different trusts (i.e. the variation between them) to identify those trusts that are doing better or worse than the 'average' trust. As characteristics such as gender, age and the route of admission (whether someone was an emergency or elective patient) are known to be related to responses, we therefore standardise different organisations to a common average case-mix when calculating organisational results. This removes demographic differences as a source of variation and provides a 'level playing field' for comparing providers. Weighting for nonresponse to either an England-level population dataset or back to the sample data for a trust would not achieve this.

Differences between trust populations in the Adult Inpatient Survey are partly addressed via standardising by gender, age and route of admission in the trust-level results<sup>12</sup>. Standardising by ethnicity would in theory also improve comparability, however whether to do this is subject to a number of considerations detailed below.

- The more variables included in the standardisation, the more complex the analysis becomes. It also greatly increases the risk of having very small groups with large weights.
- In order to weight by a certain variable, we need to have information for that variable for each respondent. Information for gender, age and route of admission is largely complete, with only very few, if any, missing cases for these variables. In 2017, all respondents had gender, age and route of admission information (taken from response data, or sample data if response data were missing). However, ethnicity information (which is only taken from response data due to data quality concerns about sample data) is less complete. If we were to additionally standardise by ethnicity, we would have to remove people from the analysis in 2017, which is not desirable, particularly in a survey with already low response rates.
- Some trusts have very low proportions of people in some ethnic groups. As weights are capped to avoid heavy weighting, this could lead to many respondents having capped weights. This should be avoided as far as possible when standardising data as it limits the comparisons that can be made.
- Standardising by ethnicity should also be avoided as it would risk standardising out genuine differences in experiences across the subgroups.

Furthermore, it should be noted that direct assessment of nonresponse bias upon survey data is difficult due to the obvious ethical implications of acquiring such data. This would require further contact with patients who do not wish to be contacted. Rather than further adjusting the data, this

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<sup>12</sup> For more information on the methodology for the trust-level results, please see the technical document which is referenced in the 'Further Information' section at the end of this document.

issue is managed by adopting best-practice methodologies so as to maximise response rates from all groups, as discussed in the 'Survey design and implementation' section of this report.

## Results for England

Some trusts have a higher response rate than others and would therefore have a greater influence over the England average if a simple mean was calculated across all respondents. To avoid this, ‘trust’ weights are applied to the England-level data. Doing so means that each trust has an equal influence over the England average for each question, regardless of differences in response rates between trusts.

Additional ‘population’ weights were also introduced for the first time in the 2017 survey, with the aim of reducing potential nonresponse bias. This involved weighting by age groups, route of admission and gender so that the weighted proportions in each group in the respondent population match those in the sampled population. Increased weight is therefore given to groups that had lower propensity to respond. A single population weight was computed for each respondent.

As the 2017 England-level results present trend comparisons across surveys from 2009 to 2017, it was also necessary to weight the historic data in the same way as for the current year. Population weights and trust weights were multiplied together to produce a single, combined weight for each question and this was applied when generating the national tables for England<sup>13</sup>.

Assuming that responses were missing at random, weighting each trust’s results to their eligible population in this way theoretically makes the trust’s results more representative of their population, thus potentially yielding a more accurate experience of the average trust. However, it is not possible to check the extent to which this ‘missing at random’ assumption is satisfied.

The introduction of nonresponse weights to the England-level results creates a ‘design effect’ that reduces the precision of statistics from the survey. This has been taken into account for year-to-year comparisons. The design effect can be estimated as the following, where  $w_i$  is the weight for respondent and  $n_{total}$  is the total number of respondents:

$$DEFF = \frac{n_{total} * [\sum_i w_i^2]}{[\sum_i w_i]^2}$$

This is then used to adjust the alpha value for the tests of column proportions in national tables for England, using  $\alpha_{new} = 2\text{-tailed probability for a result at least as extreme as } |1.95996398454 \times \sqrt{DEFF}|$ .

This weighting has been applied to the England-level results for all except the demographic questions. These questions are presented without weights applied, as it is more appropriate to present unadjusted data that describe the demographic profile of respondents, rather than average figures.

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<sup>13</sup> As this approach was new for 2017, the England-level results for the 2009- 2016 Adult Inpatient Surveys will differ slightly from the trend comparison results in the 2017 England-level results.

# Data revisions

CQC publishes a [Revisions and Corrections Policy](#) relating to these statistics. This policy sets out how CQC will respond if an error is identified and it becomes necessary to correct published data and/or reports. The NHS Patient Survey data are not subject to any scheduled revision as the surveys capture the views of patients about their experiences of care at a specific point in time. All new survey results are therefore published on CQC's website and the NHS Surveys website, as appropriate, and previously published results for the same survey are not revised.

## Further information

The England-level and trust-level results can be found on the CQC website. You can also find a 'technical document' here which describes the methodology for analysing trust-level results:

<http://www.cqc.org.uk/publications/surveys/adult-inpatient-survey-2017>

The **trust results** from previous Inpatient Surveys that took place are available at the link below:

<http://www.nhssurveys.org/surveys/425>.

The results for **England** from previous Inpatient Surveys that took place are available at the link below:

<http://www.nhssurveys.org/surveys/912>.

Full details of the methodology for the survey, including questionnaires and covering letters, instructions on how to carry out the survey, and the survey development report, are available at:

<http://www.nhssurveys.org/surveys/1084>.

More information on the NPSP, including results from other surveys and a programme of current and forthcoming surveys, can be found at:

<http://www.cqc.org.uk/content/surveys>

# Feedback

We welcome all feedback on the survey findings and the approach we have used to report the results, particularly from people using services, their representatives, and those providing services. If you have any views, comments or suggestions on how this publication could be improved, please contact Paul Williamson, User Voice Development Manager, at [patient.survey@cqc.org.uk](mailto:patient.survey@cqc.org.uk).

The information you provide will be reviewed by CQC and used, as appropriate, to improve the statistics that we publish across the NHS Patient Survey Programme.