Care Quality Commission

NHS

2019 Adult Inpatient Survey:

Quality and Methodology Report

Contents

Introduction

The Adult Inpatient Survey is the longest running survey in the NHS Patient Survey Programme (NPSP), first run in 2002 and then annually since 2004. The 2019 survey is the seventeenth iteration, and sampled inpatients aged 16 or over who were discharged from an NHS trust in England during July 2019. Each NHS trust selected a sample of 1,250 patients, by including every consecutive discharge counting back from 31st July 2019; with a minority of smaller trusts sampling as far back as January 2019[1], as required. In 2019, 143 NHS trusts took part in the survey, with 76,915 questionnaires being successfully completed by patients; an adjusted response rate of 45%.

The Survey Coordination Centre for Existing Methods (SCCEM), based at Picker, manages and coordinates the programme at a national level, on behalf of the Care Quality Commission (CQC). An overview of CQC's approach to quality within the NPSP is available in the NHS Patient Survey Programme: Quality Statement document.

This report provides detailed information on key quality and methodological issues relating to the 2019 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 detail on the development of the survey and errors made during the sampling process can also be found in the Survey Development Report and Sampling Errors Report.

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 in all written communications.
- Sending up to two reminders to non-responders.
- Long fieldwork periods to encourage lesser-heard groups, such as minority ethnic groups, to respond[2].
- 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.

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[1] Three specialist trusts had to sample back to January 2019: The Clatterbridge Cancer Centre NHS Foundation Trust (REN), Liverpool Women's NHS Foundation Trust (REP) and Birmingham Women's and Children's NHS Foundation Trust
[2] For more information, please see
http://www.nhssurveys.org/Filestore/documents/Extension_of_fieldwork_for_inpatient_survey_2007.pdf

The Adult Inpatient Survey uses a postal survey mode whereby questionnaires are sent to patients' home 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 where respondents are more likely to give positive responses. Furthermore, busy staff may not have the time to distribute questionnaires to all patients, or may not give questionnaires to patients who they do not think will give favourable feedback.

There were three main changes made to the survey methodology in 2019:

1. The questionnaire had small design changes, with colour added to key elements, such as instructions and routing information, to make them stand out. The front page of the questionnaire was also redesigned to separate survey information and questionnaire instructions.
2. Cover letters had slight changes made to them, aligning with other cover letters across the NPSP. Changes included font colour and layout amendments, in addition to an explanation on the term 'inpatient' and a full signatory (i.e. the full name and title of the trust Chief Executive) added to mailing two.
3. Removal of the CQC flyer from questionnaire mailing packs, after a 2017 pilot study indicated that the flyer did not increase response rates.

As part of the development work for 2019 Adult Inpatient Survey, a sampling review exercise was conducted with approved contactors and NHS Trusts. Based on the findings from this exercise, the following changes were made to the sampling materials for the 2019 survey:

1. All sampling materials were published simultaneously, rather than the staggered approach previously adopted.
2. The sampling instructions were reworked. Sections were re-ordered to allow for a smoother sampling preparation process and a new section 'Checks done on the sample data' was added to clarify next steps once the sample has been submitted.
3. The survey handbook had sections reordered and three new sections added, 'Survey requirements', 'Changes to the survey for 2019' and 'Managing the survey'.
4. The sample declaration form was updated to encourage trusts to provide more information on their sample and on any changes that could affect the comparability of their sample to the previous year.

Further information about these methodological changes can be found in the Survey Development Report.

All surveys in the NPSP, including the Adult Inpatient Survey follow a strict methodology, as specified in the Survey Handbook and Sampling Instructions, which all in-house trusts[3] and approved contractors[4] must follow. 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 SCCEM, based on discussion with and evidence provided by, the trust(s). No trusts were excluded from the 2019 Adult Inpatient publication.

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[3] These are trusts who have opted to carry out the survey themselves. In 2019 five trusts conducted the survey in-house.
[4] These are companies that have been approved by the CQC during a competitive tendering process to carry out surveys in the NPSP on behalf of trusts. For more information please see the NHS Surveys website.

Questionnaire development

Following analysis of the 2018 survey results and consultations with key stakeholders at CQC and NHS England and Improvement, one new question was added, four question items were modified, with no questions removed.

Prior to fieldwork, this redeveloped questionnaire was cognitively tested with 18 volunteers who had stayed in hospital for one or more night(s) in the previous six months. Respondents completed a questionnaire with a researcher to check that the questions and response options were appropriate and were understood as intended. The respondents covered a geographical spread and diverse demographic profile, as well as different admission types (e.g. emergency or waiting list/planned) and long term health conditions. 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 2019 questionnaire please see sections 2 and 3 of the Survey Development Report.

Sampling and fieldwork

Sampling

All trusts that provide adult inpatient services were eligible to take part in the survey. In total, 143 acute and acute specialist trusts participated in the 2019 survey.

Patients were eligible for the survey had they spent at least one night in hospital (and were not admitted to maternity or psychiatric units) and had been discharged during July 2019, and were aged 16 years and over. Trusts with fewer than 1250 eligible discharges in July were required to sample backwards into earlier months (working backwards from 31st July) to reach the required sample size. Despite sampling back to January 2019, three specialist acute trusts were unable to reach the required 1250 sample size but had sufficient numbers of patients over the sampling period to be included (the smallest sample received was 505 patients from The Clatterbridge Cancer Centre NHS Foundation Trust).

Fieldwork for the survey (the time during which questionnaires were sent out and returned) took place between August 2019 and January 2020. The length of fieldwork varied from one trust to another, as fieldwork can only start when the trust's sample has been approved. Across all participating trusts, the fieldwork length varied from 8 to 18 weeks (the average fieldwork length was 14 weeks). Further information about sampling process and full details of the inclusion and exclusion criteria are available in the Sampling Instructions.

Sampling error

The sample size for the Adult Inpatient Survey was 1250 discharged patients per trust; of which there are 143. Assuming the sample period is not atypical, the large sample size for the 2019 survey sample can be considered representative of all eligible inpatients in England. The sampling period was a typical July month suggesting that the provision of NHS inpatient services in July 2019 is comparable to previous survey results.

Larger samples are associated with greater confidence in results, and results that are more representative of the target population's true value. Larger samples provide data subject to less sampling error than for smaller samples.

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, making the results incomparable with previous years.

There were two trust mergers since the 2018 survey and these trusts did not receive historical comparisons in 2019:

- South Tyneside and Sunderland NHS Foundation Trust (R0B) merger was effective from 1st April 2019. Formed from the merger between South Tyneside NHS Foundation Trust (RE9) and City Hospitals Sunderland NHS Foundation Trust (RLN).
- University Hospitals of Derby and Burton NHS Foundation Trust (RTG) merger was effective from 1st July 2018. Merger between Derby Teaching Hospitals NHS Foundation Trust (RTG) with Burton Hospitals NHS Foundation Trust (RJF).

Errors in drawing samples

The chances of sampling mistakes being made by trusts (for example, excluding certain eligible patients) are minimised by multi-stage sample checks. Firstly, trusts are provided with standard Sampling Instructions to draw and review their sample. Trusts that appoint a contractor to undertake the survey on their behalf will then have their sample reviewed by their contractor. Contractors and in-house trusts are provided with a Sample Data Checklist they can use to check their sample themselves. Finally, all anonymised samples are checked by the SCCEM.

During the SCCEM's sample checking process, several items are checked against the previous two years' submissions to help ascertain whether a trust has followed the sampling instructions correctly. These include comparisons of population size, year of birth, gender, ethnicity, route of admission, discharge dates, length of stay, discharge sites, ICD-10 chapter codes, Clinical Commissioning Group (CCG), Treatment Function Codes and admission method codes. If there are any concerning discrepancies, queries will be raised with the contractor or in-house trust as appropriate.

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 SCCEM 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 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 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 contractors are encouraged to review this report to minimise the recurrence of previously detected errors. As detailed in the 2019 report there were 2 major errors and 24 minor errors identified in samples submitted to the SCCEM for this survey.

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 2019 survey was subject to), but also reduces the potential for breaches to the support received under Section 251 of the NHS Act 2006.

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 CQC's Statement of Administrative Sources. 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 historical comparisons

Part of the SCCEM'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[5]. If these are classified as major errors, historical comparisons between the current and previous years may not be possible for the trust in question.

Through this process, three trusts were found to have made historical errors. Following discussions between the SCCEM and CQC, it was decided that all three of these trusts would not receive historical comparisons in 2019:

- North West Anglia NHS Foundation Trust (RGN)

- Worcestershire Acute Hospitals NHS Trust (RWP)

- Cambridge University Hospitals NHS Foundation Trust (RGT)

A further trust (The Walton Centre NHS Foundation Trust – RET) did not receive historical comparisons in 2019, due to errors in their 2018 mailings which resulted in a large proportion of their sample not receiving a mailing. As a result the trust was excluded from the 2018 results.

For more information about the historical errors and trusts with service changes identified during the 2019 survey please see the Sampling Errors Report.

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[5] Whilst the SCCEM undertakes 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.

Fieldwork

Fieldwork for the 2019 Adult Inpatient Survey took place between August 2019 and January 2020. Every week during fieldwork, approved contractors and in-house trusts sent the SCCEM a weekly monitoring report, summarising the outcome status by use of the following codes:

- Outcome 1 = questionnaire returned completed
- Outcome 2 = questionnaire returned undelivered
- Outcome 3 = patient deceased after the start of fieldwork
- Outcome 4 = patient too ill, opted out or returned blank questionnaire
- Outcome 5 = patient ineligible (i.e. under 16 years old)
- Outcome 6 = questionnaire not returned
- Outcome 7 = patient deceased prior of fieldwork

From the above outcome codes, the adjusted response rate was calculated by dividing all patients who returned a completed questionnaire (Outcome 1) by all patients that potentially received the questionnaire and were potentially able to respond:

$$Adjusted\ response\ rate = \frac{outcome\ 1}{\sum(outcome\ 1, 4, 5\ and\ 6)}$$

Weekly monitoring allows the SCCEM to track the progress of the survey throughout fieldwork and identify and assist with any potential problems that arise. No issues were identified during fieldwork for the 2019 survey.

Data analysis and reporting

Data cleaning and editing

Survey data from each participating trust is submitted to the SCCEM for cleaning. During fieldwork, a Data Cleaning Guidance document covering the cleaning undertaken by the SCCEM is published. This document allows in-house trusts and contractors to understand and replicate the SCCEM's cleaning processes. However, trusts and contractors are required to submit raw data (i.e. uncleaned data) to the SCCEM at fieldwork close. Data is submitted in Excel, although the final dataset for the survey is in SPSS. An abridged version of this dataset 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:

- Prior to printing, electronic and hardcopies of the questionnaires from contractors and in-house trusts are correct i.e. questions, response options, routing and instructions are as they should be.
- A sample of completed questionnaires (i.e. with response data) are checked during fieldwork to ensure that no changes have been made to the questionnaire following the initial approval of hard copies.
- 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).

- o Multiple response questions have been coded correctly.
- o All response coding falls within the expected range of response options for a question.
- o Response data reflects the sample data (e.g. year of birth in the sample data matches the year of birth reported by the respondent).
- o Only eligible patients were included in the survey.

The data is 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.

Bespoke analysis may also be conducted on certain trusts in cases where the CQC and SCCEM have concerns about the quality or historical comparability of the trust's data. In 2019 bespoke analysis was conducted on two trusts[6] whose mailing information was misaligned. Results suggested that historical comparisons could still be made. Bespoke analysis was also conducted on question comparability: three of the modified questions within the 2019 questionnaire had analysis run to determine comparability with previous years. Results suggested historical comparisons for two questions were not recommended[7].

When data is 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. The procedure of data suppression is implemented across the NPSP to protect against respondents potentially being identified and because the confidence interval around the trust's question score is considered too large to be meaningful. Demographic and proxy response question items (response data) are excluded from suppression, in line with other surveys on the national programme.

When errors are found, in-house trusts or contractors are asked to correct their data and resubmit. If this is not possible, due to an error in the questionnaire mailed to patients, data is suppressed for the affected questions. There were no incidences of data suppression for individual trusts in the 2019 survey.

Statistical release

A statistical release has been published which provides full descriptive analysis of England-level results for the 2019 survey. The 2019 results were compared against previous survey years, and a multi-level analysis of subgroups was conducted to assess the experience of care for different demographic sub-populations. This is published on the CQC website.

The data is weighted in order to control for the influence individual trusts' response rates have on the England-level average[8]. For questions that are comparable across survey years, comparisons were made using z-tests to determine whether differences between 2018 and 2019 are statistically significant. Control charts displaying trend data have also been produced for each question were possible. 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

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[6] Royal Liverpool & Broadgreen University Hospitals NHS Trust (RQ6) and Mid Cheshire Hospitals NHS Foundation Trust (RBT).

[7] Question 51 and Question 66 did not receive historical comparisons in 2019.

[8] More information on the weighting approach applied to the data can be found in the 'Addressing potential non-response bias in the survey results' section of this report.

is that there has been no change in reality. The 'expected limits' are derived from 5 years' worth of data 2010 to 2014, or the first 5 years' worth of data available for that question. 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 sub-groups highlights the experiences of different demographic sub-populations. Results for each demographic sub-group were generated as adjusted means (also known as estimated marginal means or population marginal means) using a linear mixed effects model. These means were 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.

Differences of at least 0.1 standard deviations from the overall mean of the target variable are treated as being noteworthy, provided that the 95% confidence interval does not overlap the mean line.

For the 2019 survey the following demographic subgroups were analysed:

- o Age group
- o Gender
- o Religion
- o Sexual orientation
- o Ethnicity
- o Long-term health conditions
- o ICD-10 Chapter Code
- o Route of Admission (Emergency or elective)
- o Treatment function code (Medical or surgical)
- o Length of stay
- o Respondent (in person or by different proxy)

We compared the experience of different groups across a number of themes:

- o Information, communication and education: Q30 Q36 Q56 Q63
- o Respect for patient-centred values, preferences and expressed needs: Q23 Q26 Q34 Q39 Q48
- o Emotional support: Q37 Q38
- o Confidence and trust: Q24, Q27, Q35
- o Coordination and integration of care: Q32 Q54 Q61 Q65
- o Food choice: Q20
- o Hydration: Q22
- o Respect and Dignity: Q67
- o Overall: 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 on the CQC website. The results of this analysis are published in benchmark reports for each individual trust, available on the NHS Surveys website.

For questions evaluating care (scored questions), 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 on the NHS Surveys website.

A trust's question score is calculated by taking the weighted average[9] 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[10]. 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):

- o   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.
- o   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.
- o   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.

An example of one of these charts is shown below:
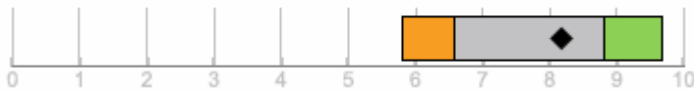
Also produced for the benchmark reports are tables giving the trust's score, the range of scores for each section and question, and the number of responses to each question.

Historical comparisons are made, where possible, against the 2018 survey. Arrows next to comparable questions indicate where the 2019 score is significantly higher or lower than the 2018 score. No arrow reflects no statistically significant change.

NHS England and Improvement National Statistics for England

Twenty questions from the 2019 survey contribute to the Overall Patient Experience Scores (OPES) as outlined by NHS England and Improvement. The domain names included in OPES are the following:

- o   Access and waiting (Q6, Q7, and Q9)

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[9] Weighting the responses adjusts for variation between trusts in age, gender and type of admission.

[10] 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.

- o Safe, high quality, coordinated care (Q33, Q50, and Q60)
- o Better information, more choice (Q34, Q57, and Q58)
- o Building closer relationships (Q23, Q25, Q26, and Q28)
- o Clean, friendly, comfortable place to be (Q14, Q15, Q16, Q19, Q40, Q42, and Q67)

More information is available on the NHS England website.

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 during the sample preparation and data cleaning stages. These checks help 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. Contractors and in-house trusts will also have internal quality assurance guidelines they follow during the survey.

SCCEM checks

There are a number of quality assurance (QA) checks undertaken by the SCCEM 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 SCCEM also checks hard copies of the covering letters and questionnaire used by in-house trusts and contractors. This can help to identify whether 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 emboldening (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 collected data, the SCCEM asks the contractor or in-house trust to rectify the error and resubmit their hard copies.

The SCCEM also checks PDF copies of completed questionnaires returned during fieldwork, in case any changes were made to the questionnaire between hard copy approval and mailing. If an error is found, the SCCEM undertakes 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). Data for the question containing the error may then be excluded from the final dataset and outputs for the affected trusts. There have been no such exclusions for the 2019 survey.

During fieldwork the SCCEM 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 receipt of questionnaires. If any concerns about the progress of the survey are identified, the SCCEM will investigate the reasons for this.

The final set of QA checks undertaken by the SCCEM 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. Third-checks are also carried out at certain milestones.

All analysis outputs based on the data (such as the trust-level results and England-level reporting) go through a two-stage QA process, checked by both the SCCEM and CQC. The SCCEM has a three-level quality assurance process for every output that ensures any errors are picked up. This usually requires the output being recreated and checked to ensure the figures are correct. Additionally, any syntax that is used to create the dataset and output is checked by a Statistician & Research Analyst or Senior Research Associate, as well as either the Chief Statistician, the Head of Survey Coordination, or the Chief Research Officer, to ensure that the methodology is being correctly carried out.

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 questionnaire design and sampling strategy, which is in turn supported by extensive QA at every stage of the survey.

Seasonal effects

All inpatients included in the Adult Inpatient Survey had a stay of at least one night during the month of July 2019. Although smaller trusts were allowed to sample back to 1st January 2019 if necessary, the vast majority of patients included in the 2019 Adult Inpatient Survey received treatment in July 2019. It is therefore possible that there may be some seasonal effects on responses – for example if staffing levels and other factors differ throughout the year. However, as the sampling period is the same for all trusts and the same as previous Adult Inpatient surveys, any such seasonal variation would not impact on the comparability of the data or its use in assessing the performance of trusts.

Response rates

Response rates for the Adult Inpatient Survey have decreased since it was first launched, from 64% in 2002 to 45% in 2019. This is consistent with other surveys in the NPSP and with industry-wide trends in social and market research. Figure 1 below illustrates response rate trends for the more established surveys in the NPSP[11]. The figure shows a clear downwards trend across all surveys, although response rates appear to have stabilised in recent years.

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[11] Please note that not all surveys are carried out annually.
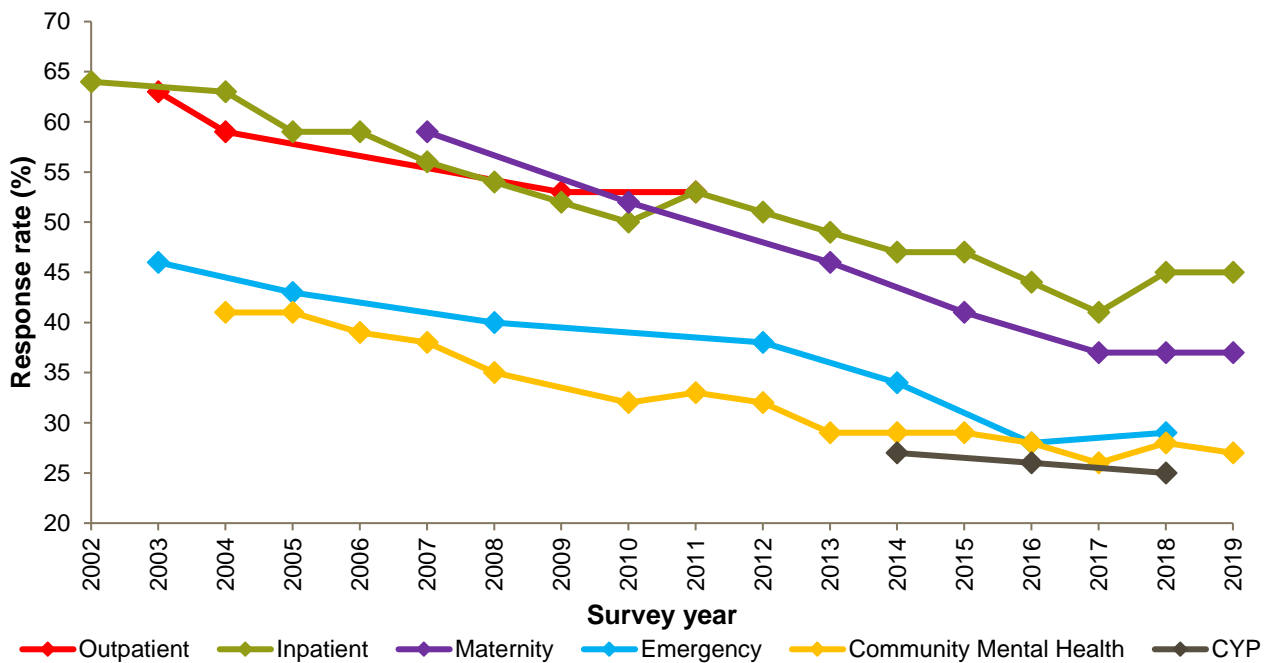
Figure 1: Response rates for established surveys in the NHS Patient Survey Programme

Non-response bias

One of the main issues that can affect survey results is non-response bias, and as response rates for surveys decline, the risk of non-response bias increases. Non-response bias refers to the risk 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 and to what extent non-response bias is present is difficult to assess, as we do not have any way of finding out how non-responders would have answered.

A further issue is that we cannot always differentiate between those who received a questionnaire but chose not to respond (non-response), versus those who did not receive a questionnaire and hence could not respond (non-contact). The number of questionnaires that are returned undelivered are logged during the course of the survey, but it is not possible to know the reasons for non-delivery.

Furthermore, patient confidentiality limits the SCCEM from assessing the data quality of the samples that were drawn. The SCCEM are sent a limited number of variables when checking samples, which do not include confidential data such as names or address details. Using the variables provided, the SCCEM are able to conduct data quality checks, such as missing data and that overall proportions for sample information (for example age, gender, route of admission, discharge rates, treatment function codes) are in line with previous year's sample data for the Trust. However, the SCCEM are prevented from conducting further data quality checks such as checking for duplicate records.

Other research, including work carried out as part of the NPSP, has shown that certain groups are consistently less likely to respond, including young people, black and minority ethnic groups (BME), and people from deprived areas[12] [13] [14].

Tables 1 and 2 below show that age and ethnic group response biases exist in the Adult Inpatient Survey. Table 1 shows responders and non-responders, while Table 2 shows the demographic profile for respondents and for the sample as a whole (everyone selected for inclusion in the survey). It can be seen that older patients are more likely to respond compared with other age groups, and to a lesser extent, patients who identify as white are more likely to respond than those from other ethnic groups. When interpreting these tables please bear in mind that it is likely that there are also inter- relationships between these groups.

Table 1 below shows key demographic profiles (taken from sample data[15]) for responders and non-responders. Please note that Table 1 is based on information from trust sample files only, and will therefore differ from response rates published elsewhere which are compiled from response data, or sample data if a response is missing. We cannot use respondent-provided information to calculate response rates, as the corresponding information is unavailable for non-responders. When calculating response rates, inpatients who have died and anyone for whom the questionnaire was undeliverable, are removed from the base.

Table 1: Responders versus non-responders sample profile for the 2019 Adult Inpatient Survey by key demographics

Demographics	Respondents	Non-responders
Gender		
Female	52	53
Male	48	47
Age		
16-35	5	19
36-50	8	18
51-65	22	21
66-80	41	21
>80	24	20
Ethnicity		
White	94	88
Multiple ethnic groups	0	1
Asian or Asian British	3	6
Black or Black British	2	3
Chinese	0	0
Any other ethnic group	1	2

* Non responders include only those with an outcome code of 4, 5 and 6
Note: Percentages are rounded to the nearest whole number - group totals may add up to more than 100%.

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[12] nhssurveys.org/Filestore/documents/Increasing_response_rates_literature_review.pdf

[13] nhssurveys.org/Filestore/documents/Review_BMEcoverage_HCC_surveys.pdf

[14] nhssurveys.org/Filestore/documents/Increasing_response_rates_stakeholder_consultation_v6.pdf

[15] Trust sample files contain all patients selected to take part in the survey and include information such as year of birth, route of admission and ethnicity, etc.

Table 2 below shows key demographics for the overall sampled cohort for the survey (taken from sample data) versus for respondents (taken from response data).

Table 2: Sample versus respondent demographic profile for the 2019 Adult Inpatient Survey

Demographic	Sample	Respondent
Gender		
Female	52	52
Male	48	48
Age		
16-35	13	5
36-50	13	8
51-65	21	22
66-80	30	41
>80	22	23
Ethnicity		
White	91	95
Multiple ethnic groups	1	1
Asian or Asian British	4	3
Black or Black British	3	1
Chinese	0	0
Any other ethnic group	2	0

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

Addressing potential non-response bias in the survey results

Non-response weighting is currently applied to the England-level data, but not the trust-level data. In considering whether to weight for non-response and whether this should be according to either the sample or population data, we need to factor in the primary aim of collecting the survey data.

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 exists on the sampling frame. Weighting is used to eliminate, or at least reduce, total non-response bias. In a non-response approach, a model is developed to estimate unknown response probabilities with weights adjusted to the estimated response probabilities. Units with the same characteristics and the same propensity to respond are grouped together to protect against model insufficiency[16]. Alternatively, if an England-level dataset exists for these key characteristics, such as the census for national population estimates, then this can be used in deriving the weighting approach. 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 or sampling units within it.

Our weighting strategies are detailed in the sections below.

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[16] statcan.gc.ca/pub/12-539-x/2009001/response-reponse-eng.htm.

Trust-level benchmark analysis

For the NPSP, the data collected is 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 non-response 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[17]. 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 2019, all respondents had data for gender, age and route of admission (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 2697 patients from the analysis in 2019.
- Some trusts have very low proportions of people in some ethnic groups. As weights are capped to avoid heavy weighting[18], this would 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[19].

It should be noted that direct assessment of non-response bias upon survey data is difficult to measure 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 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

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[17] 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.

[18] To prevent the possibility of excessive weight being given to respondents in an extremely underrepresented group, the maximum value for any weight was set at five.

[19] Potter F. (1990), A study of procedures to identify and trim extreme sample weights, Proceeding of the Survey Research Methods Section, American Statistical Association, pp.225-230.

influence over the England average for each question, regardless of differences in response rates between trusts.

Additional 'population' weights were also introduced in the 2017 survey, with the aim of reducing potential non-response 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 2019 England-level results present trend comparisons across surveys from 2009 to 2019, 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[20].

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 non-response 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 i and n_{total} is the total number of respondents:

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

This is then used to adjust the alpha value for the tests of column proportions in national tables for England, using alpha$_{new}$ = 2-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 describes the demographic profile of respondents, rather than average figures.

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 NPSP data is 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.

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[20] As this approach was new in 2017, the England-level results for the 2009 – 2016 Adult Inpatient Surveys will differ slightly from the trend comparison results in the 2017, 2018 and 2019 England-level results.

Further information

The England-level and trust-level results for the 2019 Adult Inpatient Survey can be found on the CQC website. You can also find a 'Technical Document' here which describes the methodology for analysing trust-level results.

The England and trust-level results from previous Adult Inpatient Surveys that took place between 2002 and 2019 are available on the NHS Surveys website or on request.

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 on the NHS Surveys website.

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

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 Tamatha Webster, Survey Manager, at 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 NPSP.