

**NHS Patient Survey Programme**

# **2019 Maternity Survey: Quality and Methodology Report**

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# Introduction

This report provides detailed information on key quality and methodological issues relating to the 2019 Maternity 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 be found in the [Survey Development Report](#) and the [Sampling Errors Report](#), respectively.

The Maternity Survey has been run in 2007, 2010, 2013, 2015, 2017, 2018 and 2019. The 2019 survey was sent to women who had a live birth during February (or sometimes January<sup>1</sup>) 2019. In total, 126 NHS trusts took part in the survey, with 17,151 questionnaires completed. This equates to a response rate of 37%.

The Survey Coordination Centre for Existing Methods (SCCEM), based at Picker, manages and coordinates the NHS Patient Survey Programme (NPSP) 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.

## 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 are 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 non-responders.
- Long fieldwork periods to encourage lesser-heard groups, such as minority ethnic groups, to respond<sup>2</sup>.
- A freephone language line providing translation services.
- Contact details for Mencap which offers support for people with learning difficulties to complete the questionnaire.
- Use of a Quality Assurance Framework ensuring all survey materials and results are reliable and accurate.

Like other surveys in the NPSP, the Maternity 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. The Maternity Survey

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<sup>1</sup> Trusts with fewer than 300 eligible deliveries in February were required to sample backwards into January until either a sample size of 300 was achieved, or January 1<sup>st</sup> was reached.

<sup>2</sup> For more information please see:

[http://www.nhssurveys.org/Filestore/documents/Extension\\_of\\_fieldwork\\_for\\_inpatient\\_survey\\_2007.pdf](http://www.nhssurveys.org/Filestore/documents/Extension_of_fieldwork_for_inpatient_survey_2007.pdf)

samples all live births during a defined time period (i.e.: a census at a defined point in time) and in doing so reduces any selection bias that may be present if the survey was administered by front line staff at the time of their hospital visit when, for example, 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.

A number of steps are taken to ensure the quality of the survey design and implementation. As with all surveys in the programme, an external 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, Department of Health and Social Care, National Maternity Voices, National Childbirth Trust, NHS trust representatives and maternity service users. In addition to the advisory group a wider consultation exercise was undertaken for the 2019 survey involving stakeholder interviews and interviews with recent mothers. Questionnaires are also cognitively tested with recent service users, as described in the [Questionnaire development](#) section below.

There were six main changes to the survey methodology in 2019:

- 1) The inclusion of three additional variables in the sample frame: gender, time of delivery and number of babies born at delivery.
- 2) Inclusion of patients' full residential postcode in the sample frame instead of only postcode sector, to enable deprivation mapping.
- 3) Removal of the CQC flyer from questionnaire mailing packs, after a 2017 pilot study indicated that it did not increase response rates.
- 4) Slight changes to the format and wording of covering letters, and the inclusion of more information on data protection following the introduction of the General Data Protection Regulation (GDPR) in 2018.
- 5) Amendment to the [Sample Declaration Form](#) to ask for the total number of deliveries at the trust in both January and February, in order to help reduce sampling queries.
- 6) Opt-out posters made available in the 10 most commonly spoken languages in England.

Further information about these methodological changes can be found in the [Survey Development Report](#).

The Maternity Survey follows a strict methodology, as specified in the [Survey Handbook](#), which all in-house trusts<sup>3</sup> and approved contractors<sup>4</sup> 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 Maternity Survey publication.

## Questionnaire development

Following consultation with key stakeholders and analysis of the 2018 survey results, 11 new questions were added to the 2019 questionnaire, 9 questions were removed, and 41 pre-existing

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<sup>3</sup> These are trusts that have opted to carry out the survey themselves. In 2019 four trusts conducted the survey in-house.

<sup>4</sup> These are companies that have been approved by the CQC during a competitive tendering process to carry out NPSP surveys on behalf of trusts. For more information please see the [NHS Surveys website](#).

questions were amended. The instructions on the front cover of the questionnaire were also re-worked.

Prior to fieldwork, the redeveloped questionnaire was cognitively tested with 22 women who had given birth within the previous year. Respondents completed a questionnaire with a researcher to check that the questions and response options were appropriate and were being understood as intended. The respondents covered a broad geographic and demographic profile as well as a variety of birth experiences. 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 the [Survey Development Report](#).

## Sampling and fieldwork

### Sampling

All trusts that provide maternity services and have a sufficient number of monthly births were eligible to take part in the survey<sup>5</sup>. In total, 126 trusts participated in the 2019 survey.

Women were eligible for the survey if they had a live birth during February 2019, were aged 16 years or over at the time of delivery, and gave birth under the care of an NHS trust (including home births). Trusts with fewer than 300 eligible deliveries in February were required to also include women who gave birth in January 2019, beginning with deliveries on 31<sup>st</sup> January and working backwards until either a sample size of 300 was achieved or January 1<sup>st</sup> was reached.

Fieldwork for the survey (the time during which questionnaires were sent out and returned) took place between April and August 2019. This approach allowed for the six-week postnatal period to have concluded by the time fieldwork commenced, which is important because a number of questions in the questionnaire relate to postnatal care. Further information about the sampling process and full details of the inclusion and exclusion criteria are available in the [Sampling Instructions](#).

### Attribution data

Some women in the sample may not have received their antenatal and/or postnatal care from the trust at which they gave birth. This could be due to the woman moving home or having to travel for more specialist care. Therefore, in addition to a sample file, trusts are also asked to submit an attribution file to the SCCEM. This file identifies which of the women in the sample were also likely to have received their antenatal and postnatal care from the trust, and is compiled using electronic records where possible, or by matching women's residential postcodes against the trust's geographical boundary. The aim of collecting this information is to improve the accuracy with which survey responses are attributed to a trust.

Attribution files are submitted after the sample file has been submitted and approved. This is mainly to avoid delays in the sample approval process, and because postnatal care information may not yet be available at the time the sample is drawn. Submitting attribution data is optional,

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<sup>5</sup> Trusts with fewer than 300 live births across January and February 2019 took part voluntarily. In 2019 one trust (James Paget University Hospitals NHS Trust) chose to opt out of the survey due to low birth numbers.

though without it antenatal and postnatal benchmarked results cannot be produced for the trust in question. In total, 118 of 126 trusts submitted attribution data in 2019.

## Sampling error

The Maternity Survey's minimum sample size of 300 was set to ensure that samples would be large enough to remain robust while still including trusts with smaller throughputs of women during the sampling period.

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 which makes the trust's results incomparable with previous years.

There were three trust mergers since the 2018 survey. Colchester Hospital University NHS Foundation Trust merged with The Ipswich Hospital NHS Trust to form East Suffolk and North Essex NHS Foundation Trust. Derby Teaching Hospitals NHS Foundation Trust merged with Burton Hospitals NHS Foundation Trust to form University Hospitals of Derby and Burton NHS Foundation Trust. These two merged trusts did not receive historical comparisons in 2019.

University Hospitals Birmingham NHS Foundation Trust also acquired Heart of England NHS Foundation Trust, but as the acquiring trust was a non-maternity trust, results remain historically comparable.

## 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. First, trusts are provided with standard [Sampling Instructions](#) to review their sample. Trusts that appoint a contractor to undertake the survey on their behalf will then have their sample reviewed by their contractor. In-house trusts are provided with a [Sample Data Checklist](#) they can use to check their sample themselves. Finally, all pseudonymised 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, ethnicity, delivery place and site code. If there are any concerning discrepancies, queries will be raised with the trust's contractor 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 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 the exclusion of home birth patients, 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 contractors are encouraged to review this report to minimise the recurrence of previously detected errors. As detailed in the 2019 report 11 major errors and 17 minor errors were 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 excluded trusts

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<sup>6</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.

Through this process, two trusts were found to have made historical errors. Following discussions between the SCCEM and CQC, it was decided that one of these trusts<sup>7</sup> would not receive historical comparisons in 2019.

For more information about the historical errors identified during the 2019 survey please see the [Sampling Errors Report](#).

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<sup>6</sup> Whilst the SCCEM 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.

<sup>7</sup> The Rotherham NHS Foundation Trust (RFR).

## Fieldwork

Fieldwork for the 2019 Maternity Survey took place between April and August 2019. Each week during fieldwork, approved contractors and in-house trusts sent a weekly monitoring report to the SCCEM, summarising the survey's outcome status with the following codes:

- Outcome 1 = questionnaire returned completed
- Outcome 2 = questionnaire returned undelivered
- Outcome 3 = mother or baby deceased after fieldwork commenced
- Outcome 4 = mother too ill, opted out or returned blank questionnaire
- Outcome 5 = mother ineligible
- Outcome 6 = questionnaire not returned
- Outcome 7 = mother or baby deceased prior to fieldwork

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

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

Weekly monitoring allows the SCCEM to track the progress of the survey throughout fieldwork and identify and assist with any problems that arise.

## 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 participating trusts and contractors to understand the SCCEM's cleaning process and replicate it themselves. However, in-house trusts and contractors are required to submit raw (i.e. uncleaned) data to the SCCEM at fieldwork close. Data is submitted to the SCCEM in Excel, but the final dataset for the survey is in SPSS. A 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:

- 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).
- Response data reflects 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 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<sup>8</sup> whose sample was approved very late and as such only had six weeks of fieldwork. Results suggested that historical comparisons could still be made.

When data is suppressed for a question, which occurs when there are fewer than 30 responses within 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 NPSF 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 program.

When errors are found, in-house trusts or contractors are asked to correct their data and resubmit.

## 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 sub-groups was conducted to assess the experience of care for different demographic sub-populations. The statistical release 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<sup>9</sup>. 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. For the 2019 iteration of the survey, control charts have also been produced. For each question, a chart displaying the trend data from 2013 to 2019 has been included where possible. For questions evaluating care, the chart is a 'p-chart' which plots the percentage of the most positive response to a question (top box) and shows the 'expected limits' of variation in survey results under the hypothesis 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 is at play or that there has been a change in behaviour. However, an isolated data 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

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<sup>8</sup> Doncaster and Bassetlaw Teaching Hospitals NHS Foundation Trust (RP5), and George Eliot Hospital NHS Trust (RLT).

<sup>9</sup> 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.

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 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, provided that the 95% confidence interval does not overlap the mean line.

For the 2019 survey the following demographic sub-groups were analysed:

- Age group
- Named midwife status
- Parity<sup>10</sup>
- Type of delivery
- Stirrups usage
- Ethnic group
- Religion
- Sexual orientation
- Long-term health condition
- Index of Multiple Deprivation (IMD) decile

The themes of person-centred care against which these sub-groups were compared are as follows:

- Choice: B4, F1
- Respect for patient-centred values, preferences and expressed needs: B10, D6, C20, E2, F8, F9
- Shared decision making (antenatal): B17
- Shared decision making (labour and birth): C19
- Involvement of family and friends: C12, D7
- Confidence and trust (labour and birth): C21
- Confidence and trust (postnatal): F10
- Feeding support: E3, E4, F16
- Information, communication and education (antenatal): B6, B9
- Information, communication and education (labour and birth): C18, C22, D5
- Information, communication and education (postnatal): F15, F18
- Availability of staff: C15, C17, D4

## 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](#).

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<sup>10</sup> Parity refers to whether or not a woman has given birth before.

The results of this analysis are published in benchmark reports for each individual trust, available on the [NHS Surveys website](#). Three types of benchmark reports are produced, one for each section of the questionnaire: antenatal care, care during labour and birth, and postnatal care. All trusts receive a report containing their labour and birth results. Trusts also receive an antenatal and/or postnatal report as long as they completed the attribution exercise<sup>11</sup> and had a sufficient number of responses from women who received antenatal and/or postnatal care from their trust.

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 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>12</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.

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. An additional table in the labour and birth reports shows the number of respondents, response rate, and demographic information at trust-level and for all respondents across England<sup>13</sup>.

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 indicates that there was no statistically significant change.

<sup>11</sup> See the [Attribution data](#) section of this report for further details.

<sup>12</sup> If a question has fewer than 30 responses for a given trust, results are not reported in order to protect patient anonymity, and because the confidence interval around the trust's question score is considered too large to be meaningful. Additionally, for any such question, the trust is excluded from England averages and is not given a section score.

<sup>13</sup> England figures are calculated using survey data from all trusts - these figures refer to the sampled population, which may have different characteristics to the population of England.

## NHS England National Statistics for England

Six questions from the 2019 survey contribute to the Overall Patient Experience Scores (OPES) as outlined by NHS England (B6, B17, C15, C19, D6, and E4). These support the NHS Outcomes Framework indicator “Improving women and their families’ experience of maternity services”. 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 aim 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 bolding (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 an iterative 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 an 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 Maternity 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 women included in the Maternity Survey gave birth in February (and also January for smaller trusts), and will therefore have received their antenatal and postnatal care at a similar time of year. There may therefore be some seasonal effects on responses – for example if staffing levels or birth rates differ throughout the year. However, as the sampling period is the same for all trusts and the same as previous maternity surveys, any such seasonal variation would not impact on the comparability of the data or its use in assessing the performance of trusts.

### Attribution data

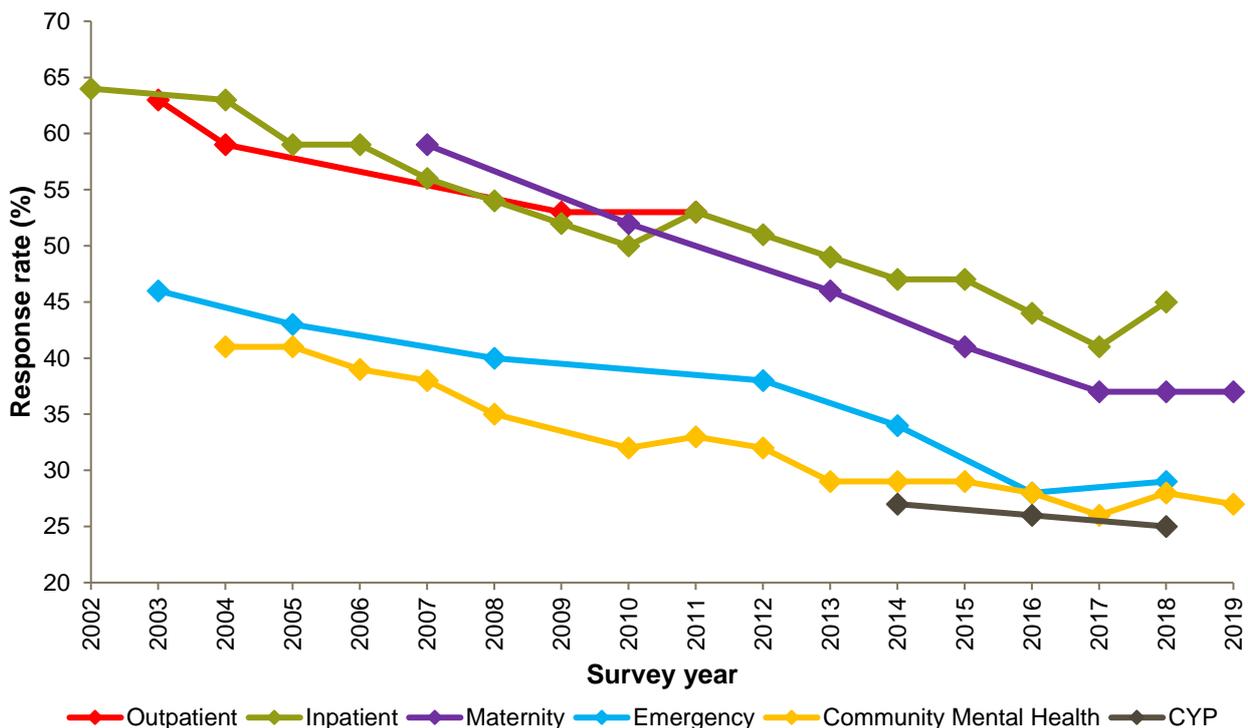
The attribution information provided by trusts has several limitations, and as such the data from the antenatal and postnatal sections of the questionnaire cannot be considered as statistically robust as the data from the labour and birth section, as explained below.

- As attribution data is provided voluntarily, it cannot be considered representative of all trusts in the survey; only trusts that completed the exercise can be compared. Trusts are only identified as being 'better' or 'worse' within the subset of trusts that completed the exercise, therefore it is not a true benchmark for performance across England.
- For trusts that do not keep electronic records of antenatal and postnatal care, attribution is based on the residential location of respondents. Therefore it is not possible to identify whether women received care from a different provider for reasons such as requiring specialist care or moving home. This may mean that some respondents are included in the data despite having received care from another trust.

- Trusts complete the attribution exercise themselves, and due to the limitations of this process the SCCEM is unable to verify the accuracy of the information. This means we cannot be certain about the reliability of the attribution data.

## Response rates

Response rates for the Maternity Survey have decreased since it was first launched, from 59% in 2007 to 37% 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<sup>14</sup>. The figure shows a clear downwards trend across all surveys.



**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 outcome that those who chose to respond to the survey are different from those who do not 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 knowing 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

<sup>14</sup> Please note that not all surveys are carried out annually.

hence could not respond (non-contact). For example, a patient could have changed address but not have informed the trust. The number of questionnaires that are returned undelivered is logged during the course of the survey, but it is not possible to know the reasons for non-delivery.

Furthermore, patient confidentiality prevents the SCCEM from assessing the data quality of the samples that were drawn, as it is not permissible to access 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, black and minority ethnic groups (BME), and people from deprived areas<sup>15 16 17</sup>.

Table 1 below shows key demographic profiles (taken from sample data<sup>18</sup>) 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, women who have died (or whose baby has died) and anyone for whom the questionnaire was undeliverable, are removed from the base.

**Table 1:** Respondent versus non-responder sample profile for the 2019 Maternity Survey

<b>Demographics</b>	<b>Respondents</b>	<b>Non-responders</b>
<b>Age</b>		
16 - 18	<1%	1%
19 - 24	7%	16%
25 - 29	20%	27%
30 - 34	38%	31%
35+	35%	25%
<b>Ethnicity</b>		
White	73%	70%
Mixed	2%	2%
Asian or Asian British	8%	11%
Black or Black British	3%	5%
Arab or other ethnic group	3%	3%
Not known	12%	9%

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

<sup>15</sup> [nhssurveys.org/Filestore/documents/Increasing\\_response\\_rates\\_literature\\_review.pdf](https://nhssurveys.org/Filestore/documents/Increasing_response_rates_literature_review.pdf)

<sup>16</sup> [nhssurveys.org/Filestore/documents/Review\\_BMEcoverage\\_HCC\\_surveys.pdf](https://nhssurveys.org/Filestore/documents/Review_BMEcoverage_HCC_surveys.pdf)

<sup>17</sup> [nhssurveys.org/Filestore/documents/Increasing\\_response\\_rates\\_stakeholder\\_consultation\\_v6.pdf](https://nhssurveys.org/Filestore/documents/Increasing_response_rates_stakeholder_consultation_v6.pdf)

<sup>18</sup> Trust sample files contain all patients selected to take part in the survey and include information such as year of birth, date of delivery 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 response profile for the 2019 Maternity Survey

<b>Demographics</b>	<b>Response</b>	<b>Sample</b>
<b>Age</b>		
16 - 18	<1%	1%
19 - 24	6%	13%
25 - 29	20%	25%
30 - 34	38%	34%
35+	36%	29%
<b>Ethnicity</b>		
White	82%	71%
Mixed	2%	2%
Asian or Asian British	9%	10%
Black or Black British	4%	4%
Arab of other ethnic group	1%	3%
Not known	3%	10%

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

It can be seen from both tables above that older mothers (aged 30 years and above) are more likely to respond compared with other age groups, and women 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.

## 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. Re-weighting is used to eliminate, or at least reduce, 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<sup>19</sup>. 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

<sup>19</sup> [statcan.gc.ca/pub/12-539-x/2009001/response-reponse-eng.htm](https://statcan.gc.ca/pub/12-539-x/2009001/response-reponse-eng.htm)

whole rather than individual cases or sampling units within it. For the NPSP, the eligible population equates to the complete drawn sample.

### **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 demographic characteristics such as parity and age 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 Maternity Survey are partly addressed via standardising by age and parity in the trust-level results<sup>20</sup>. Standardising by ethnicity would in theory also improve comparability, however whether to do this is subject to a number of considerations as 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 age and parity is largely complete, with only very few, if any, missing cases for these variables. In 2019, all respondents had age information (taken from response data, or sample data if response data was missing), and parity information was only missing for 247 respondents (1.4%). However, ethnicity information (which is only taken from response data, as sample data tends to be incomplete or unreliable) is less complete. If we were to additionally standardise by ethnicity, we would have to remove a further 447 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, 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<sup>21</sup>.

Furthermore, it should be noted that direct assessment of non-response bias upon survey data is difficult due to the obvious ethical implications of acquiring such data. This would require further contact with patients who may 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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<sup>20</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.

<sup>21</sup> 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 group so that the weighted proportions in each age 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 2013 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<sup>22</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 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.

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

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 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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<sup>22</sup> As this approach was new in 2017, the England-level data reported in the 2013 and 2015 Maternity Surveys will differ slightly from the 2013 and 2015 data reported in the 2019 England-level results.

## Further information

The England-level and trust-level results for the 2019 Maternity 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 Maternity Surveys that took place in 2007, 2010, 2013, 2015, 2017 and 2018 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](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 NPSP.