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NHS Maternity Survey 2021

Sampling Errors Report



Ipsos MORI



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Introduction

Sample files for all 122 trusts participating in the 2021 Maternity Survey were submitted to the Coordination Centre for Mixed Methods (CCMM) at Ipsos MORI for confirmation that samples had been drawn correctly before mailings could start. Sample data checks of this kind were first introduced in 2007 and were found to aid trusts in avoiding common errors prior to fieldwork commencing. Such mistakes may lead to patients being incorrectly included or excluded from the sample, delays in the survey process and/or poor data quality. In addition to the sample file, all trusts were asked to submit a separate antenatal and postnatal attribution data file directly to the CCMM.

The 2021 Maternity survey was coordinated by the CCMM at Ipsos MORI, whereas previous surveys were coordinated by the Picker Institute (under the title of the Survey Coordination Centre for Existing Methods). Furthermore, a sample upload portal was used for the first time this year, which flagged errors *before* the samples and attribution data were submitted to the CCMM.

This report gives a summary of errors found during the course of the CCMM's checks of trust sample and attribution data for the 2021 survey. It is important to note that this report only gives details of the errors found by the CCMM; sample data may have contained further errors which would have been identified and corrected during checks by approved contractors (where one was used).

This document outlines the following types of errors:

- **Major errors** – errors that require the sample to be redrawn, commonly where ineligible patients have been included or eligible patients have been excluded.
- **Minor errors** – errors that do not require the sample to be redrawn, but instead require amendments to be made to the sample data.
- **Section 251 breaches** – failures to adhere to the stated processes which give the survey approval for the common law duty of confidentiality to be put aside.
- **Historical errors** – errors relating to a trust's previous survey sample when checking the 2021 sample.
- **Attribution data errors** – errors specifically found in relation to the attribution data submitted by trusts.

Trusts and contractors should use this document to become familiar with the errors found by the CCMM to minimise the chance of similar errors occurring in future survey years.

Frequency of Errors

During the 2021 sample checking period, the CCMM detected two major errors and 37 minor errors. In addition, two historical errors were identified, and two Section 251 breaches occurred. In total, 112 of the 122 trusts submitted attribution data to the CCMM, and 11 errors were identified in these files. Table 1.1 shows the frequency of errors by type of error.

Table 1.1: Frequency of errors/breaches in the 2021 Maternity survey by error type

Type of error	Frequency
Major errors	2
Minor errors	37
Historical errors	2
Attribution errors	11
Section 251 breaches	2

Major Errors

Errors are classified as 'major' if they require the trust to re-draw their sample, add patients or replace patients. If major errors are not corrected, they can invalidate a trust's participation in the survey, preventing the trust's data from being used by the Care Quality Commission (CQC) for regulatory and assessment activities.

Two major errors were identified in 2021, which resulted in two patients being removed as described in more detail below.

Including ineligible patients

Exclusion criteria for the Maternity Survey is specified in the sampling instructions each year. One of the criteria is that individuals who have had their baby taken into care should be excluded from the sample. This includes babies put in foster care or adopted. If trusts do not hold this information on their electronic systems, they are advised to remove these individuals from the sample when the list is validated by member(s) of the clinical midwifery team.

One trust included an individual in their sample who should have been removed as the baby was taken into care. This was picked up by the trust after the initial sample submission once fieldwork had begun, therefore the individual was inadvertently included in the initial invitation mailing but were subsequently removed and coded as ineligible in the final dataset.

A second criteria is that individuals who are private patients should be excluded from the sample. This includes private service users (non-NHS) or those who gave birth at a private maternity unit, wing or hospital. One trust included a private patient in their sample who should not have been included. This was only picked up by the CCMM during attribution data checking, in discussion with the trust about the patients included in their attribution data submission, which was already after the patient had responded to the survey. The individual was subsequently coded as ineligible in the final dataset by CCMM and their contractor and excluded from reporting.

Minor Errors

Errors are considered to be ‘minor’ if the trust’s sample is comprised of eligible patients and if data can be corrected without the need for the sample to be redrawn. In total, 37 minor errors were identified during the sample checking process by the CCMM. Table 1.2 shows the types of minor errors found in the 2021 samples and the frequency in which these occurred.

Table 1.2: Frequency of minor errors in the 2021 Maternity survey by error type

Type of minor error	Frequency
COVID-19 variables incorrect	13
Maternity care setting coding missing or incorrect	7
Mobile telephone numbers unavailable	4
CCG codes incorrect	3
Actual delivery place coded incorrectly	3
Ethnic group missing	3
Site codes coded incorrectly	2
Time of delivery incorrect	2

The majority of the errors were in relation to the COVID-19 variables. More details about each of the minor errors detected are provided below.

COVID-19 variables missing or incorrect

For the 2021 survey, trusts were asked to provide two new variables relating to COVID-19: COVID-19 diagnosis and COVID-19 treatment. CQC planned to use these to compare experiences of individuals diagnosed with COVID-19 during the time of their labour and birth to those with no such diagnosis. The diagnosis variable was derived from ICD-10 codes U07.1 COVID-19 virus identified and U07.2 COVID-19 virus not identified and coded into five specified categories. The treatment variable was derived from NHS Trust locally held records and coded into three specified categories. The CCMM cross-checked the two variables and queried anything that seemed illogical.

Trusts were able to submit their COVID-19 variables in their main sample submission or within their attribution file. Five trusts who submitted updated COVID-19 variables as part of their attribution data submission initially failed to update one or more cases when doing so – in other words they left the variable coded as ‘0’ (an invalid code) by mistake. All five trusts updated the affected cases in their

resubmission. One other trust did not provide updated, valid codes for either of their COVID-19 variables, so their data was unusable for analysis.

Seven other trusts misinterpreted the sampling guidance and initially submitted COVID-19 treatment variables that were not in accordance with the coding guidance for some or all cases. All these cases were corrected, and the data resubmitted.

Maternity Care Setting (actual place of birth) coding missing or incorrect

This year, trusts were asked to supply a new variable - Maternity Care Setting (Actual place of birth). This was collected in addition to Actual Delivery Place (ADP) to conduct analyses by delivery location and to enable CQC to make comparisons of the data across the two variables, to assess whether ADP can be replaced with MCS in future. Two trusts were unable to provide any data for this variable; one trust was unable to provide data for 27 cases. Two further trusts were only able to populate MCS after their initial sample submission and two other trusts amended this variable when updating ADP or site code data.

Mobile telephone numbers unavailable

This year, reflecting the move to mixed methods, trusts were asked to supply mobile telephone numbers (where available for sampled individuals) and a separate variable, which indicated whether or not a mobile number was included. The CCMM only received the latter of these two variables. The provision of a mobile number allowed SMS reminders to be sent to encourage participation in the survey.

The sample upload portal automatically flagged samples where the mobile phone number indicator was '0' for more than half of cases, meaning that a mobile number had not been included. Some trusts had difficulties providing adequate volumes of mobile phone numbers in their samples. The average percentage of phone numbers provided was 90%, but this ranged from 10% to 100% across trusts. The reasons why trusts couldn't provide mobile numbers varied e.g. provision of landline numbers higher than for mobiles; mobile numbers being stored in 'telephone' field (rather than 'mobile', so were initially missed); mobile numbers not logged in electronic databases at all; consent field to share the number being 'blank'. Four trusts were able to source additional mobile numbers and increase the proportion of cases with valid numbers.

Clinical Commissioning Group (CCG) codes incorrect

All trusts were asked to provide a 3-character CCG code for each patient included in the sample. This code should be for the CCG which would be billed for the maternity care, not the service user's resident CCG code. A list of [valid English CCG codes](#) was provided in the Sampling Instructions.

The CCMM identified three trusts with incorrect CCG codes. This included using commissioning region or hub codes rather than a specific group as well as using old codes that were no longer in use. The CCMM requested that the trust/contractor amend the invalid codes where possible and re-submit the sample file.

Actual delivery place coded incorrectly

Actual Delivery Place (ADP) denotes the type of location where a woman gave birth, such as at a domestic address (for home births), or at one of the four general types of delivery ward (e.g. a midwife-led ward). In the sample file, ADP should be coded according to the specifications in the [NHS Data Dictionary](#).

The sample upload portal automatically flagged samples where an ADP code was missing for any mother and samples with any '5' codes (private hospital) or '6' codes (other hospital or institution) present, which would suggest that these mothers are ineligible.

The CCMM also checked the proportions of each code in the 2021 sample against that of 2019, raising queries with a trust/contractor if considerable differences were noted for any of the codes. Three trusts confirmed that they had used certain ADP codes incorrectly – each trust was asked to supply the correct codes to their contractor.

Ethnic group data missing

Mother's ethnic group is required to evaluate non-response from different ethnic categories. The ethnicity of a person is specified by that person and should be coded using the 17 item alphabetical coding specified by [NHS Digital](#). Any patient whose ethnic category is unknown may be coded as "Z" (not stated) or left blank.

The sample upload portal automatically flagged samples that included invalid codes for ethnicity. Furthermore, the CCMM checked the ethnic profile in the 2021 sample against that of 2019, raising queries with a trust/contractor if considerable changes were noted in one or more codes or if samples contained a combined total of 10% or more missing cases or coded as "Z" (not stated).

Thirty four trusts had 10% or more missing cases or coded as "Z" (not stated) for ethnic group. The proportions ranged from 10% to 40%. Of these, three trusts were able to provide revised ethnicity codes for some of the missing/not stated cases reducing the proportion of missing/not stated cases.

Site codes coded incorrectly

Trusts were asked to record the site where a delivery occurred using the five character [NHS Trust Site Codes](#) (maintained by NHS Digital). They were further advised to leave the cell blank for home births (code 1), deliveries that took place outside the trust such as in ambulances and car parks (code 8) and if the ADP was not known (code 9), unless it was known that the delivery took place in hospital.

The sample upload portal automatically flagged samples that included invalid site codes. The CCMM queried a trust/contractor when site code proportions were considerably different from 2019 and when a site code was missing for a mother who should have one or present for one who should not have one.

One trust submitted incorrect site codes as part of its sample, but this was subsequently updated to code 0 as the birth did take place in hospital. One other trust assigned a site code even though ADP was code 9 (unknown) so this site code was subsequently removed.

Time of delivery incorrect

The time of delivery should be provided for all mothers in the format of the 24-hour clock, without seconds. If there were multiple births, only time of delivery for the first baby should be entered.

The sample upload portal automatically rejected samples with a time that was not between 00:00 and 23:59 and also flagged samples where a delivery time was missing for any mother. The CCMM checked the distributions of births across delivery times in the 2021 sample against that of 2019, raising queries with a trust/contractor if considerable differences were noted. For two trusts, data entry errors were made resulting in no deliveries taking place between 16:00 and 00:00 and all deliveries reportedly taking place between 00:00 and 01:00 – the data was corrected by both trusts/contractors.

Section 251 Breaches

The 2021 Maternity survey sought and gained Section 251 approval under the NHS Act of 2006. This approval allows the common law duty of confidentiality to be put aside to allow for the processing of patient identifiable data without consent. Any breaches of the terms and conditions of Section 251 approval are immediately communicated to CQC, who in turn, notify the Confidentiality Advisory Group.

Two trusts committed S251 breaches during the sample submission and checking process in 2021:

1. One trust emailed their sample file to their contractor while responding to queries that had been raised. The file was securely deleted by the contractor. Sample files must only be sent securely.
2. One trust uploaded the sample file to their contractor before the sample declaration form had been approved. The file was securely deleted by the contractor. Sample files should only be uploaded to contractors once declaration forms have been approved.

Historical Errors

When checking samples, the CCMM compared submitted sample data for 2021 against the 2019 sample data¹ for each trust². Having this comparison is useful to show what is 'normal' for the trust, assuming no major changes have taken place in the interim that could affect the trust's maternity population (such as a merger). Occasionally, discrepancies will be noted, which suggest a historical error has been made (which was not able to be picked up at the time). As in previous years of the Maternity Survey, if these are subsequently classified as major errors, historical comparisons between the current year and previous year(s) may not be possible. The historical data may also be excluded from all other uses including national statistics and CQC's monitoring tool.

Two historical errors were identified during this year's sample checking, both relating to coding for the variable 'Actual delivery place' in 2019. This should record the type of ward an individual delivered in, not the type of professional who was leading the delivery. For one trust, we queried a higher proportion of cases coded as 'In NHS hospital – consultant ward' and no cases coded as 'In NHS hospital – Consultant/General medical practitioner/Midwife combination ward' compared to 2019. The trust confirmed that the consultant ward option was correct, and that the combination option should not have been selected previously.

For another trust, the proportion of cases coded as 'In NHS hospital – consultant ward' decreased substantially in 2021 compared to 2019 and at the same time those coded as 'In NHS hospital – Consultant/General medical practitioner/Midwife combination ward' increased substantially. The trust confirmed that the shift in 2021 was the result of an error being corrected where previously patients were recorded as delivering on a consultant ward and not a mixed professional unit.

The CCMM would classify these as **minor** errors given that this variable is not a key part of analyses so historical comparisons between 2021 and 2019 are still possible.

¹ Comparisons were made against 2019 data as this was the last survey for which sampling was completed. Sampling for the 2020 Maternity Survey was not completed before the survey was cancelled due to COVID-19.

² Where data are available. For trusts that have merged since the last survey, this comparison was not carried out.

Attribution Data errors

In addition to submitting a sample file, trusts were also asked to submit a separate attribution data file directly to the CCMM. This allowed CCMM to determine whether each mother received her antenatal and/or postnatal care from the trust, and therefore whether her responses to the antenatal and postnatal sections of the questionnaire could be attributed to the trust. Submission of the file was not a mandatory requirement of the survey, but antenatal and postnatal benchmark reports can only be produced for trusts who submit usable attribution data.

The CCMM merges the sample and attribution files during data analysis. The records in the two files must match exactly so the CCMM can be sure the antenatal and postnatal information is being matched to the correct women. Trusts were therefore requested to use the final version of their sample data when creating their attribution data file and were asked to contact their contractor to ensure they had this, as sample data was often amended during or after sample checking. Using the final version of the sample data also avoided the CCMM needing to query erroneous changes that were flagged in the attribution data file when that was compared against the final sample data.

The sample upload portal automatically flagged attribution data file submissions where the number of cases or individual patient record numbers differed compared to the approved sample file. This pre-empted an issue detected in 2019 with trusts providing attribution data files with missing or additional records when compared to the associated sample file. This year, trusts were unable to submit their attribution data file until the records matched exactly. In instances where trusts removed a patient who was found to be deceased after the sample had been approved, the patient record number was retained but all other data removed.

In total, 112 (92%) of 122 trusts submitted an attribution data file in 2021, and 11 errors were detected. Table 1.3 shows the variables that were affected by errors in the 2021 attribution data files. More detail about each of the errors is provided below.

Table 1.3: Attribution variables affected by errors in the 2021 Maternity survey

Variable affected by errors	Frequency
Antenatal check-up variable only	3
Postnatal care in the community variable only	2
Attribution exercise variable only	3
All three variables	3

Antenatal Check-up variable

The CCMM checked the distributions for the antenatal check-up variable in the 2021 sample against that of 2019 (where available), querying with a trust if differences of 10% or more were noted. The attribution data submissions for two trusts were queried for this reason, both trusts reviewed their data and updated, resulting in an increase in the proportion of cases coded as '1'³.

For one other trust, comparable data from 2019 was unavailable, however, the CCMM queried whether all cases should have been coded as '0'⁴ for the antenatal check-up variable. The trust reviewed and revised with data for both codes 0 and 1 provided in the resubmitted file.

Postnatal care in the community variable

The CCMM also checked the distributions for the postnatal care in the community variable in the 2021 sample against that of 2019 (where available), querying with a trust if differences of 10% or more were noted. The attribution data submissions for two trusts were queried for this reason, both trusts reviewed their data and updated. In both cases, the errors were confirmed as being a mistake when applying the codes in the original submission.

Attribution exercise variable

For the attribution exercise variable, the CCMM checked that only valid codes had been used and queried what method was used if code 4 'other' was used by a trust. The attribution exercise variable was also sense-checked against the postcode match variable. Three trusts applied incorrect codes for the attribution exercise variable. All three originally used code 4 (other) but subsequently updated to code 2 (postcode) or code 3 (combination of postcode and electronic).

All three attribution variables

For three trusts, all three variables relating to attribution - antenatal check-up variable, postnatal care in the community variable and the attribution exercise variable – were revised and resubmitted following queries from the CCMM.

For one trust the CCMM queried a 10%+ difference in 2021 compared to 2019 for antenatal data and for both antenatal and postnatal data for another. Both trusts checked how the exercise was completed in 2019 and decided to re-do their submissions using electronic records rather than postcode or a combination of postcode and electronic records. This resulted in revised data being submitted for all three variables for both trusts and with much smaller differences between the 2021 and 2019 data.

For the third trust – in correspondence with the CCMM to resolve a query relating to the attribution exercise variable, the trust confirmed that 21 cases could not be found electronically or by postcode and, as a result, had been coded as '0' for the antenatal and postnatal variables erroneously. These cases were reviewed and the antenatal, postnatal and attribution exercise variables were updated where necessary.

³ Code 1 = for maternity service users who did receive their antenatal check-ups from the trust AND were booked in to deliver at the trust before week 25 of their pregnancy.

⁴ Code 0 = for maternity service users who either did not receive their antenatal check-ups from the trust or received some of their antenatal check-ups from the trust BUT were not booked to deliver at the trust until 25 weeks pregnant or later.

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