# Inpatient Survey 2013: Sampling Problems

## 1. Introduction

For the 2013 Adult Inpatient Survey all trusts were required to submit their samples to the Co-ordination Centre for final quality control checks before they were able to mail out any questionnaires. Final sampling inspection by the Co-ordination Centre was introduced for the 2006 inpatient survey and was found to be useful for identifying errors made when drawing samples and thereby helping trusts to avoid the common mistakes that can result in delays to the survey process, and problems with poor-quality samples. This document describes the errors that have been made when samples have been drawn (both this year, and in previous survey years) and the recommendations made by the Co-ordination Centre to correct these. Errors are divided into major (those requiring the sample to be re-drawn or patients to be replaced) or minor (those that could be corrected before final data submission).

This document should be used by trusts and contractors to become familiar with past errors and to prevent these from recurring. If further assistance is required, please contact the Co-ordination Centre on 01865 208127.

## 2. Frequency of errors

This year all samples from the 156 trusts taking part in the 2013 Adult Inpatient Survey were checked by the Co-ordination Centre. In 2011, an exception was made where only in-house trust samples were checked, hence the fewer number of errors found for 2011, as shown in Table 1 below. This means that the number of errors in 2011 cannot be directly compared with other years.

In 2013 there were 16 major errors noted in the sample checking phase and the Co-ordination Centre advised thirteen trusts to re-draw their sample (sometimes more than once). Further to this, an additional 53 minor errors were also identified, as can be seen in Table 1.

***Table 1 – Frequency of major and minor errors by survey year***

| | 2013 | 2012 | 2011† | 2010 | 2009 | 2008 | 2007 | 2006 |
|---|---|---|---|---|---|---|---|---|
| **Major errors** | 16 | 21 | 16 | 9 | 19 | 24 | 28 | 38 |
| **Minor errors** | 53 | 38 | 11 | 41 | 39 | 70 | 70 | 141 |

†Note that in 2011 only in-house trust samples were checked

## 3. Types of major error

Sixteen major errors were identified during sample checking in 2013, spread across thirteen trusts (see Table 2 below). Errors are classified as major if they require the trust to re-draw their sample, or to replace patients from the sample. If major errors are not corrected, the trust's survey data cannot be used by Care Quality Commission for regulatory activities, such as monitoring trusts' compliance with the essential standards of quality and safety, and the trust will be reported as not submitting data for the national survey. Table 2 below outlines the frequency of major errors by the type of error that was made. More detail about each of these errors is provided below.

***Table 2 – Frequency of major errors by type of major error and survey year***

| Major errors | 2013 | 2012 | 2011† | 2010 | 2009 | 2008 | 2007 | 2006 |
|---|---|---|---|---|---|---|---|---|
| Incorrectly excluded by specialty code | 8 | 0 | 0 | 0 | 0 | 0 | 2 | 4 |
| Inclusion of ineligible patients (based on route of admission information) | 3 | 6 | 6 | 6 | 5 | n/a | n/a | n/a |
| Sampled by consecutive admission | 1 | 0 | 2 | 2 | 3 | 4 | 2 | 3 |
| Random samples | 0 | 0 | 0 | 1 | 4 | 5 | 9 | 10 |
| Sampled incorrect period | 0 | 1 | 0 | 0 | 2 | 3 | 3 | 1 |
| Screened single night stays | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 1 |
| Incorrectly excluded by age | 1 | 1 | 1 | 0 | 1 | 4 | 0 | 1[1] |
| Zero overnight stay patients included | 0 | 3 | 2 | 0 | 1 | 0 | 2 | 2 |
| Inclusion of private patients | 1 | 2 | 0 | 0 | 0 | 3 | 0 | 1[2] |
| Inclusion of maternity/termination of pregnancy patients | 0 | 1 | 2 | 0 | 0 | 2 | 8 | 8 |
| Exclusion of some hospital sites | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| Inclusion of psychiatry patients | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Other (broken down for 2012): | 0 | | | | | | | |
| Exclusion of eligible patients due to mistake in query used to extract patient list | 0 | 2 | - | - | - | - | - | - |
| Exclusion of particular CCG codes | 0 | 1 | - | - | - | - | - | - |
| Inclusion of overseas patients | 0 | 1 | - | - | - | - | - | - |
| Inclusion of patients both admitted and discharged from a community hospital | 1 | 1 | - | - | - | - | - | - |
| Mismatching of names and addresses in the mailing list | 0 | 1 | | | | | | |
| Exclusion of daycase patients that stayed overnight | 0 | 1 | - | - | - | - | - | - |
| *Total Other* | *1* | *7* | *2* | *0* | *1* | *1* | *0* | *7* |
| **Total** | **16** | **21** | **16** | **9** | **19** | **24** | **28** | **38** |

†Note that in 2011 only in-house trust samples were checked

## Incorrectly excluded by specialty code

In 2013 a more detailed examination of specialty codes was undertaken. Seven trusts were found to have excluded eligible patients on the basis of their specialty (one trust made the same error in subsequent submissions). There were seven instances of exclusions of patients with main specialty codes of 502 (gynaecology), and one of patients with main specialty codes of 180 (accident & emergency).

These exclusions of eligible patients were identified by comparing each trust's distribution of specialty codes with data from previous years. Trusts who had incorrectly excluded specialty codes of 502 also tended to show a significant drop in the proportion of females in their samples.

In these cases trusts were queried about the change, subsequently reminded of the eligibility criteria and asked to resubmit their sample having included the eligible records.

[1] In 2006, one trust incorrectly excluded patients who were 16 years old and thus eligible for the survey. In the 2007 sampling errors document, this trust was coded as "other" because there were no other examples of this occurring.

[2] In 2006, one trust incorrectly included private patients in their sample. In the 2007 sampling errors document, this trust was coded as "other" because there were no other examples of this occurring.

In most cases trusts excluded these patients as an extra precaution to preclude the possibility of including maternity or termination of pregnancy patients in their samples. Some instances of this error were caused by a mistake in the query used to extract the patient list.

The detailed checks for main specialty codes also highlighted problems with exclusion criteria based on this item. Patients are coded under the main specialty of the consultant in charge of their care; some patients may be coded under an excluded specialty, even though the care they received did not correspond to an excluded characteristic. This issue was found to be particularly prevalent with main specialty codes of 501 (obstetrics) and 502 (gynaecology), which were often used interchangeably by trusts. In general this issue only introduces bias between trusts with different coding practices, although in certain instances a change in coding practice at a trust can introduce bias between a trust's data from year to year. One trust in particular saw a significant decrease in the proportion of females in their sample this year when compared to 2012, due to a change in coding practice that categorised more patients under main specialty code 501.

## Inclusion of ineligible patients (based on route of admission information)

In the sample file, acute trusts are asked to include the two-digit route of admission code for each patient. This information has been required since 2009[3] and allows ineligible patients to be more easily identified and excluded.

Three trusts had patients in their sample whose ineligibility was identified by their route of admission codes (see Table 2 above); these were all patients admitted through maternity services (i.e. route of admission codes of 31 or 32).

In these cases trusts were informed of this issue, reminded of the eligibility criteria and asked to resubmit their sample having replaced the ineligible records.

## Sampled by consecutive admission date

In 2013 one trust was found to have sampled by consecutive admission date in the sample checking phase. The range of admission dates was unusually small, extending over the course of only 15 days. Furthermore, the longest length of stay was only 14 days.

This major error was detected in samples every year but one since 2006, as shown in Table 2. In 2011 this error was identified when samples were found to include patients that had been discharged in September and October, indicating that at some point in the process the list of patients had been sorted by date of admission. This error can also be identified by the maximum length of stay being of short duration in comparison to that of the previous year. For example, if a trust's maximum length of stay was 90 days in the previous year's study but appeared as only 18 days in the current study it is likely that this mistake has been made.

This error can occur at multiple stages of the sample generation. For example, a trust may generate a large initial sampling frame that conforms to all the inclusion criteria, then generate a second list once the exclusion criteria have been applied, then another list of 900 patients to be sent to the Demographics Batch Service, and a final list of 850 patients to be sent to the Co-ordination Centre. If any of these lists are sorted by admission date rather than discharge date, this error could occur.

[3] In fact 2008 was the first survey year that route of admission information was requested. However, in this first year of it being asked, trusts were required to recode the information to indicate whether a patient was 'emergency' or 'planned'. Inconsistencies across trusts in the re-coding of this information led to full information on route of admission being requested in 2009.

## Random samples

Although this has not occurred in recent years, in previous years a number of trusts have submitted samples that led us to suspect they had drawn a random sample of all patients seen over a period of one or more months. In these samples it was typical to find the earliest date of discharge very close to the start of the month (usually the 1st of the month) and the latest date of discharge at the very end of the month. Given that trusts are instructed in the guidance manual to sample back from the end of one of three possible months (June, July or August), the last day of that chosen month should always be the latest discharge date. However, if a trust draws their sample correctly, it would be unlikely for the earliest date of discharge to be in the first few days of the month. Any samples where the earliest date of discharge falls in the first few days of the month are investigated further, initially by comparing the sample with samples from the same trust submitted in previous years, and then by contacting trusts to seek resolution and reassurance on the issue. If it is the case that the trust has drawn a random sample, trusts will be required to re-draw the sample and to resubmit it for final approval.

## Sampled incorrect period

No trusts made this error in 2013, but in 2012 one trust did not sample from the end of the month and was asked to re-draw their sample starting from the last day of their chosen month, as specified in the guidance. In previous years trusts have also been found to sample outside of the three months specified in the guidance (see Table 2).

## Screened single night stays

In 2013 one trust made the mistake of excluding patients who had stayed for only one night. The trust was advised to re-draw their sample and include the patients who had spent just one night in hospital. No trusts made this error in 2012, although it has been seen on various occasions in other years.

## Incorrectly excluded by age

In order to ensure that no patients under the age of 16 are included in the sample, trusts sometimes exclude all patients born in the most recent eligible year. In the case of the 2013 survey this was 1997 and one trust made this error. This is not permissible because it excludes eligible patients born in that year.

In 2013 a number of trusts submitted samples without patients born in 1997, but when queried by the Co-ordination Centre, acceptable assurances were given that no patients had been wrongfully excluded on this basis. Equally, all trusts that submitted samples including patients with a year of birth of 1997 were asked to confirm that patients were aged 16 at the time of sampling.

## Zero overnight stay patients included

To be eligible for the survey, patients must stay for at least one night in hospital. For the purposes of this survey, this requires that their discharge date is at least one day later than their admission date. In 2012, three trusts submitted samples which included patients who had not spent a night in hospital. Trusts were asked to remove these patients from the sample and replace them with eligible patients. In 2013 no trusts made this mistake.

## Inclusion of private patients

The national inpatient survey only samples NHS patients and specific instruction is provided in the guidance manual to exclude all private patients. However, in 2013 one trust submitted a sample containing private patients and was requested to re-submit their sample having replaced these patients (see Table 2).

## Inclusion of maternity/termination of pregnancy patients

The guidance manual explicitly states that maternity patients must be excluded from the sample, as in all previous inpatient surveys in the NHS patient survey programme. This refers to any patients coded with a main specialty of 501 (obstetrics) or 560 (midwife) and admitted for management of pregnancy and childbirth, including miscarriages. In addition, any patients admitted for a planned termination of pregnancy must also be excluded from the survey due to issues of privacy and sensitivity.

In 2013 no maternity or termination of pregnancy patients were identified from ineligible specialty codes. It should be noted that three trusts included such patients, but since they were identified from ineligible route of admission codes they have been treated accordingly in this report.

## Exclusion of some hospital sites

In 2008, one trust excluded their new children's hospital on the mistaken assumption that all patients treated there would be too young to participate. In the past five survey years no trusts have made this error, as can be seen in Table 2.

## Inclusion of psychiatry patients

The guidance manual states that patients admitted to hospital for primarily psychiatry reasons should not be included in the sample, as in all previous inpatient surveys in the NHS patient survey programme. As can be seen in Table 2, trusts have not made the mistake of including psychiatry patients in their samples for the past five survey years. In 2008 one trust submitted a sample containing a patient who was admitted under the specialty of learning disability.

## Other

Inclusion of patients both admitted and discharged from a community hospital: The guidance states that patients who have only spent time in a community hospital should not be included in the sample. In 2013 one trust included patients both admitted and discharged from a community hospital and was requested to re-submit their sample having replaced these patients.

# 4. Types of minor error

Fifty-three minor errors were identified during sample checking in 2013, spread across 40 trusts. Errors are considered to be minor if they can be corrected without the need for the sample to be re-drawn or for patients to be replaced. Trusts that have made minor errors are advised to make the necessary corrections to the sample information prior to submitting the final data set to the Co-ordination Centre at the close of the survey.

Table 3 (below) details the frequency of minor errors by type of minor error and survey year. More details about each of these errors are provided below.

## Incorrect CCG coding

Incorrect coding of the CCG billed for the patient's care was found in 16 samples submitted by trusts in 2013. The majority of problems detected this year were either in relation to missing CCG codes or use of invalid codes. In such cases, trusts were queried and it was requested that the correct codes be input.

## Missing or incorrect route of admission data

As mentioned above, acute trusts are asked to include the two-digit route of admission code for each patient in the sample file. This information can be used to identify ineligible patients which, if

present, constitute a major error (see Section 3). Minor errors relating to route of admission information have also been found for a number of years, however. In 2013 one trust submitted data with incorrect codes in the route of admission data (local codes of 14 and 15 were used instead of the correct codes of 12 and 11, respectively).

Other issues seen in previous years have been:

- Missing codes
- Use of basic codes '1' and '2'
- Invalid codes used

***Table 3 – Frequency of minor errors by type of minor error and survey year***

| Minor problems | 2013 | 2012 | 2011† | 2010 | 2009 | 2008 | 2007 | 2006 |
|---|---|---|---|---|---|---|---|---|
| Incorrect CCG coding | 16 | 2 | 3 | 15 | 9 | 26 | 19 | 30 |
| Missing or incorrect route of admission data | 1 | 1 | 1 | 8 | 10 | 8 | n/a | n/a |
| Incorrect ethnic or gender coding | 9 | 6 | 1 | 5 | 7 | 18 | 12 | 19 |
| Missing or incorrect treatment centre data | 1 | 2 | 2 | 4 | 5 | 1 | 6 | 12 |
| Main specialty miscoding | 7 | 0 | 0 | 3 | 1 | 4 | 6 | 0 |
| Date format used | 0 | 2 | 1 | 3 | 0 | 3 | 6 | 22 |
| Incorrectly calculated 'Length of Stay' (LOS) | 3 | 6 | 0 | 3 | 5 | 9 | 11 | 15 |
| Treatment coding used instead of main specialty | 5 | 0 | 0 | 0 | 0 | 1 | 7 | 16 |
| Other (broken down for 2012): | | | | | | | | |
| Incorrect DoH trust code | 2 | - | - | - | - | - | - | - |
| Record number formatted incorrectly | 1 | 5 | - | - | - | - | - | - |
| Incorrect site of admission/discharge codes | 8 | 4 | - | - | - | - | - | - |
| Incorrect GMPC coding | - | 10 | - | - | - | - | - | - |
| *Total Other* | *11* | *19* | *3* | *0* | *2* | *0* | *3* | *27* |
| **Total** | **53** | **38** | **11** | **41** | **39** | **70** | **70** | **141** |

†Note that in 2011 only in-house trust samples were checked

## Incorrect ethnic or gender coding

In all survey years a number of trusts have coded ethnic group or gender incorrectly (see Table 3).

In 2013, nine trusts submitted samples where ethnicity information had been incorrectly coded. Incorrect codes included the use of 'Y', 'X', 'U' or '99' where cells should have been left blank.

There were no errors with coding gender in 2013. Common errors include using 'Male' and 'Female' rather than the specified codes of '1' and '2', using 'M' and 'F', or submitting samples where there is missing gender information for some patients in the sample.

## Missing or incorrect treatment centre data

The guidance states that patients who spend any of their hospital stay at a treatment centre should be coded as '1' in the sample information or '0' if they did not. One trust, whose data had included treatment centre admissions in previous years, submitted data indicating no treatment centre admissions for 2013. After we queried the data the trust realised there had been a coding error and amended it.

  

## Main specialty miscoding

Due to the aforementioned extensive checks on specialty codes this year, more errors in specialty coding were uncovered than in previous years. Common mistakes were either missing data or incorrect coding (the latter was generally uncovered through comparing distribution of codes with previous years). In 2013, seven trusts were found to have coded data incorrectly and were asked to ensure that the necessary amendments were made prior to submitting the final data set to the Co-ordination Centre at the close of the survey.

## Date format used

In 2013 no trusts submitted samples where dates (e.g. day of admission) were supplied in date format, rather than in numeric form as specified in the guidance. In such cases in the past, the trust was asked to re-submit the file with the columns for dates coded as numeric, before the file could be checked.

## Incorrectly calculated 'Length of Stay'

Three trusts incorrectly calculated lengths of stay in their sample submissions in 2013. Miscalculations were on a small scale, only a few at each trust; queries were raised and trusts were asked to amend these data accordingly.

## Treatment coding used instead of main specialty code

In 2013, five trusts made the mistake of submitting treatment codes rather than main specialty codes (see Table 3). When specialty codes were first assessed for inclusion in the 2005 adult inpatient survey, the Co-ordination Centre was informed that treatment codes were deemed to be both unreliable and more likely to disclose the actual treatment (and by inference the condition) of the patient.

## Other

A number of other errors were noted in samples submitted by trusts for final checking in 2013:

Incorrect DH Coding: This year Department of Health organisation code was asked for in addition to information already provided in the sample file in previous years. Two trusts submitted samples with incorrect codes.

Record number formatted incorrectly: As in 2012 record numbers were required this year, in the format IP13XXXNNNN (where XXX represents Department of Health organisation code and NNNN is a unique 4-digit number, e.g. 0001, 0002, 0003 etc.). One sample was submitted with incorrectly formatted record numbers, which the trust was asked to amend.

Incorrect site of admission/discharge codes: A further eight trusts submitted samples containing incorrect site of admission or discharge codes, which were required to be corrected by the trusts.

Incorrect GMPC Coding: In 2013, General Medical Practice Code (GMPC) was no longer a required field.

# 5. Historical errors

This year's sample checking uncovered several historical errors, that is errors that had been made in previous years but were amended for the 2013 submission.

Two trusts had been omitting eligible patients in previous years' samples. One trust had been omitting all patients who had not had a procedure during their stay, due to an error in the query used to extract the patient list. Another trust had excluded patients who had been on an A&E observation ward.

A third trust had been carrying out random samples based on a month's discharges, rather than sampling all eligible patients from the end of the month and working backwards until they compiled sufficient numbers.

Finally, one trust appeared to have sampled incorrectly in previous years, although the exact nature of the error was not ascertained. It seems probable that they had been omitting eligible emergency patients since the discharge range was shorter in 2013. Furthermore the breakdown of emergency and elective admissions in the 2013 sample was more in line with other trust data than the previous years' samples had been.

  