1 Inpatient survey 2009: Sampling Problems

1.1 Introduction

For the 2009 adult inpatient survey, trusts were asked to submit their sample to the Co-ordination Centre for final quality control checks before any questionnaires were mailed out. This sample checking procedure had been introduced for the 2006 inpatient survey and was found to be useful for identifying sampling errors and avoiding the common mistakes that can result in delays to the survey process, and problems with poor-quality samples. This document describes the errors made in sampling and the recommendations made by the Co-ordination Centre to correct these. Errors are divided into major (those requiring re-sampling) or minor (those that could be corrected before final data submission). This document also demonstrates the continual overall improvement seen in the quality of submitted samples since the sampling checking protocol was implemented.

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

1.1 All errors

There were 19 major errors noted in the sample checking phase and the Co-ordination Centre advised 17 trusts to redraw their sample (sometimes more than once). This compares favourably to 2008, when there were 24 major errors spread across 16 trusts, and to 2007, when there were 28 major errors spread across 23 trusts. In the first year of sample checking (2006), there were 38 major errors spread across 28 trusts.

There was also a noticeable decrease in the number of minor errors, with 39 detected in 2009, compared to 70 in both 2008 and 2007. This was also an improvement on the 2006 survey, where 141 minor errors were detected. Overall, 30 trusts were identified as having made minor errors, compared to 56 trusts in 2008, 46 trusts in 2007 and 80 trusts in 2006.

	2009	2008	2007	2006
Major errors	**19**	**24**	**28**	**38**
Minor errors	**39**	**70**	**70**	**141**

1.2 Major errors

Nineteen major errors were identified during sample checking in 2009, spread across 17 trusts. Errors are classified as major if they require the trust to resample, or to remove or replace patients from the sample. If major errors are not corrected, the trust's survey data cannot be used for the measurement of performance indicators and the trust will be reported as not having submitting data for the national survey.

Major errors	2009	2008	2007	2006
Inclusion of ineligible patients (based on route of admission information)	5	n/a	n/a	n/a
Randomised sampling	4	5	9	10
Consecutive admissions	3	4	2	3
Sampled incorrect period	2	3	3	1
Screened single night stays	2	0	1	1
Incorrectly excluded by age	1	4	0	1*
Zero night stay patients included	1	0	2	2
Inclusion of private patients	0	3	0	1†
Inclusion of maternity/termination of pregnancy patients	0	2	8	8
Excluded some hospital sites	0	1	1	0
Inclusion of psychiatry patients	0	1	0	0
Incorrectly excluded by specialty code	0	0	2	4
Other	1	1	0	7
Total	**19**	**24**	**28**	**38**

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

This information field asks the acute trust to include the two-digit route of admission code for each patient. Route of admission information was first asked for in 2008 but trusts were asked to code each patient simply as 'emergency' or 'planned'. Supplying the full route of admission information provides more information about each patient and allows ineligible patients to be identified and excluded.

Five trusts had small numbers of patients in their sample whose ineligibility was identified by their route of admission codes. Typically, the hospital route of admission code indicated the admission was maternity-related and all patients which had ineligible route of admission codes were removed from their sample files and replaced.

Random samples

Some trusts submitted samples that led us to suspect they were randomised samples of all patients seen over a period of one or more months. Typically, the earliest date of discharge was 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. As trusts were instructed in the guidance manual to sample back from the end of one of three possible months, the last day of the month should always be the latest discharge date. All cases where the earliest date of discharge was in the first few days of the month were investigated further, initially by comparing the 2009 sample to that of previous years, and then contacting trusts to seek resolution and reassurance on the issue.

Four samples submitted to the Co-ordination Centre were detected as using random sampling methods and we requested that these trusts re-draw the sample and to resubmit it for final approval. This is a slight improvement on last year when five trusts made this error.

* 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. In this document, they have been recoded to match this category of major error.

† 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 this document, the have been recoded to match this category of major error.

Sampled by consecutive admission date

In 2009, three trusts submitted samples with unusually brief maximum lengths of stay. This major error was observed in four samples in 2008 and two samples in 2007. Two samples included only patients who had been both admitted and discharged within the same month, giving the longest length of stay in these samples as 26 and 28 days. One sample included patients only admitted during August and the final days of July, resulting in a maximum length of stay of 29 days. Such a pattern of admissions and discharges suggested that, at some point, the trusts had selected their sample based upon consecutive admission dates rather than on consecutive discharge dates. This error can occur at multiple stages of the sample generation and, because of this, it is very difficult to convince trusts that this error has occurred. For example, a trust may generate a large initial sampling frame that conforms to all the inclusion criteria, and then generate a second list once the exclusion criteria have been applied, then another list of 900 patients to be sent to the National Strategic Tracing Service (NSTS), 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 data, this error could occur.

All three trusts were asked to resubmit new samples to the Co-ordination Centre.

Sampled incorrect period

Two trusts sampled dates or time periods not prescribed by the survey guidance:

- One trust submitted an August sample but this had been drawn before the trust's records had been fully updated for that month. As trust records are updated chronologically, the last days of the month were under-represented; there were no discharges from the 30th and 31st August in the sample. They were notified of this error and resubmitted a new sample file that included the appropriate number of patients discharged on the 30th and 31st August (50 in total).
- One trust misunderstood the sampling instructions and although they compiled a sample of consecutive discharges, they sampled forward in time rather than backwards from the last day of their chosen sample month. This resulted in a sample that ran from 1st June 2009 to 8th July 2009. They were notified of this error and resubmitted a new sample file drawn consecutively from 31st July back to 22nd June.

Screened single night stays

In 2009, two trusts made the mistake of excluding patients who had stayed for one night only. No trusts made this mistake in 2008 and one made it in 2007. The trusts were both advised to re-draw their sample, including patients who had spent just one night in hospital.

Incorrectly excluded by age

One trust deliberately excluded all patients who were born in 1993 to ensure that all patients in their sample were 16 years or over at the time the sample was drawn. As this would result in the exclusion of eligible patients, we requested that they redraw the sample using full date of birth (day, month and year) to ensure all eligible patients have a chance of being selected for the sample. This is a slight improvement on last year when four trusts made this error.

Zero overnight stay patients included

To be eligible for the survey, patients must stay overnight 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 2009, one trust included 25 patients who had not spent a night in hospital. They were removed from the sample and replaced with eligible patients. In 2008, no trusts made this error, compared to two trusts in 2007.

Other

One trust in 2009 included in their sample a patient who was born in 1994. This patient was under the age of 16 at the time of sampling so was ineligible for inclusion in the survey. Their inclusion was queried and they were removed from the sample file and replaced.

1.3 Major errors which occurred in previous surveys

In previous inpatient surveys, other errors have been made which were not replicated in the 2009 survey. As the purpose of this document is to provide information on how to avoid making sampling errors, these previous major errors are discussed below:

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. No trusts in 2009 mistakenly included some private patients in their samples, an improvement from 2008 when three trusts made this error.

Inclusion of maternity/termination of pregnancy patients

The guidance manual explicitly stated that maternity patients were to be excluded from the sample, as in all previous inpatient surveys in the NHS patient survey programme. These patients were defined as:

> "Any patients coded with a main specialty of 501 (obstetrics) or 560 (midwife) and admitted for management of pregnancy and childbirth, including miscarriages, should be excluded from the sample".

In addition, any patients admitted for a planned termination of pregnancy are also excluded from the survey due to issues of privacy and sensitivity.

Samples submitted in 2009 showed significant improvement upon previous years. No samples were submitted to the Co-ordination Centre containing patients who should have been excluded under these criteria. This compares favourably to previous years: four trusts in 2008 and eight trusts in both 2006 and 2007 submitted samples containing patients with main specialties of obstetrics or midwifery.

Excluded some hospital sites

No trusts made the error this year of excluding some hospital sites when drawing their sample. In 2008, one trust made this error by excluding their new children's hospital on the, mistaken, assumption that all patients treated there would be too young to participate.

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. In 2009, no trusts included patients admitted for psychiatric reasons, an improvement from 2008 when one patient was admitted under the specialty of learning disability.

1.4 Minor errors

Thirty-nine minor errors were identified during sample checking in 2009, spread across 30 trusts. Errors are considered to be minor if resampling or replacement of patients is not necessary. Trusts that have made minor errors are advised that corrections would need to be made to the sample information before the final data set was submitted to the Co-ordination Centre at the close of the survey.

Minor problems	**2009**	**2008**	**2007**	**2006**
Missing or incorrect route of admission data	10	8	n/a	n/a
Incorrect PCT coding	9	26	19	30
Incorrect ethnic or gender coding	7	18	12	19
Incorrectly calculated Length of Stay (LOS)	5	9	11	15
Missing or incorrect treatment centre data	5	1	6	12
Main specialty miscoding	1	4	6	0
Date format used	0	3	6	22
Treatment coding used instead of main specialty	0	1	7	16
Other	2	0	3	27
Total	**39**	**70**	**70**	**141**

Missing or incorrect route of admission data

This information field asks the acute trust to include the two-digit descriptive code as used within the NHS Commissioning Data Sets. In 2008, the Co-ordination centre asked for a simple coding of 'emergency' or 'planned' and the change in data requested in 2009 survey may be responsible for some of the errors that occurred when completing this data field.

The main issues were:

- Missing codes
- Use of basic codes '1' and '2'
- Code incorrectly applied to patients
- Use of invalid codes

Overall, ten trusts either did not include route of admission data for all patients in their sample file, or made errors in this data field. This compares to eight trusts in 2008.

Incorrect PCT coding

Incorrect coding of PCT of residence was another common cause of minor errors, and was detected in nine trusts' samples. This is a significant improvement from 2008 when there were errors in the PCT coding in 26 samples.

The issues detected were:

- missing codes
- High proportion of code X98 (Primary Care Trust code not applicable e.g. overseas visitors, Wales, Scotland or Northern Ireland).
- SHA code used instead of PCT code
- Five-digit codes used

Incorrect ethnic or gender coding

In total, seven trusts did not code patients' ethnicity as specified in the guidance manual. This is an improvement on 2008 when 17 trusts had not coded ethnicity as specified.

The most common error concerned patients for whom ethnicity information was not known. The Co-ordination centre uses different codes for patients whose ethnicity is 'unknown' (this information has not been collected) and patients whose ethnicity is 'not stated' (when asked, patients who declined to state their ethnicity). Some trusts do not distinguish between these categories on their PAS systems so were advised to code all such patients' ethnic category as 'unknown'. Other errors included the use of invalid codes, such as '0' or 'X' for cases where ethnic information is not known.

In 2009, no trusts miscoded gender information. This is an improvement from 2008 when one trust made this error, and 2007, when this was detected in five samples.

Incorrectly calculated Length of Stay

Five trusts did not calculate length of stay correctly, down from 9 trusts in 2008, 11 trusts in 2007 and 15 trusts in 2006. In all cases where length of stay was miscalculated, the Co-ordination Centre recalculated this, then checked to ensure that no patients were included who had not stayed overnight and that those who had only stayed a single night were not excluded. Trusts were informed of this and asked to check if the admission and discharge dates were correct for those patients involved.

Missing or incorrect treatment centre data

Five trusts in 2009 did not include correct treatment centre data for all patients in their samples. The most common problems were incorrect coding (for example, all patients erroneously coded as treatment centre admissions) and missing codes. This error has increased in frequency since 2008, when just one trust did not indicate whether patients had been treated in a treatment centre, or supplied incorrect information. It is, however, a slight improvement from the six trusts in 2007 and 12 in 2006 that made this error.

Main specialty miscoding

One trust did not include main speciality information for all patients. This compares to four trusts in 2008 and six trusts in 2007. This information was supplied on resubmission by the trust.

Date format used

No trusts submitted dates in date format rather than in numeric format as specified in the guidance. This compares favourably with the three trusts which did so in 2008, the six in 2007 and the 22 in 2006.

Treatment coding used instead of main specialty code

No trusts made the error of submitting treatment codes rather than main specialty code, down from one trust in 2008, seven trusts in 2007 and 16 in 2006. 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 errors

One trust included a patient with no date of birth recorded. This information was included in the resubmitted data file.

One trust included a patient with an admission date that was in the future. This was queried and had occurred due to a data entry error. This data field was corrected on resubmission.