Inpatient Survey 2012: Sampling Problems

1. Introduction

For the 2012 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 2012 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 2012 cannot be directly compared with 2011, however comparisons can be drawn with 2010 and earlier survey years.

In 2012 there were 21 major errors noted in the sample checking phase and the Co-ordination Centre advised sixteen trusts to re-draw their sample (sometimes more than once). Further to this, an additional 38 minor errors were also identified, as can be seen in Table 1.

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

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

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

3. Types of major error

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

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

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.

Six trusts had patients in their sample whose ineligibility was identified by their route of admission codes (see Table 2 above). For at least one trust, substantial numbers of patients in the sample were found to be ineligible when route of admission codes were examined; these were all patients admitted through maternity services (i.e. route of admission codes of 31 or 32).

[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.

[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.

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 2012 no trusts were found to have sampled by consecutive admission date in the final sample checking phase. However, this major error was detected in two trust samples in 2011 and has been detected in samples in every year 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.

Random samples

Although this did not occur in 2012 or 2011, 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

One trust in 2012 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

No trusts made this error in 2012, but in 2011 one trust made the mistake of excluding patients who had stayed for one night only. The trust was advised to re-draw their sample and include patients who had spent just one night in hospital.

Incorrectly excluded by age

Previously, in order to be sure that no patients under the age of 16 were included in the sample, trusts have excluded all patients born in the most recent eligible year. In the case of the 2012 survey this was 1996 and one trust made this error. This is not permissible because it excludes eligible patients just above the age cut-off.

In 2012 a number of trusts submitted samples without patients born in 1996, 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 1996 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.

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 2012 two trusts submitted samples containing private patients and were 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 2012, one sample was submitted to the Co-ordination Centre containing patients with a main specialty code of 501 who should have been excluded. This error was also seen in 2011, but prior to that had not been seen since 2008.

Exclusion of some hospital sites

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. For the past four 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 three survey years. However, in 2008 one trust submitted a sample containing a patient who was admitted under the specialty of learning disability.

Incorrectly excluded by specialty code

This has not been a problem for a number of years now, but in 2007 two trusts submitted samples where patients with certain specialty codes had been excluded from the sample.

Other

Exclusion of eligible patients due to mistake in query used to extract patient list: In order to generate the sample of 850 patients, trusts use a query to extract eligible patients from their records system. This query is set up in order to exclude patients that are not elibile for the survey,

such as maternity patients, however mistakes in this query can mean that certain eligible patients are excluded when this query is run. This issue was detected during final sample checking when the sampling period and distribution of patients by route of admission was examined. Samples which had either a longer sampling period than the previous year and/or where the distribution of patients by route of admission was substantially different from that of the previous year were queried. In two cases, it was found that a mistake in the query had led to eligible patients being excluded from their list which was reflected by the trusts having to sample back further to reach the sample size of 850 and skewing the ratio of emergency/elective admissions.

Additional issues identified in trust samples in 2012 included:

- Exclusion of particular PCT codes (patients with a PCT code of YDD were mistakenly excluded by one trust)
- Inclusion of overseas patients
- Inclusion of patients both admitted and discharged from a community hospital
- Mis-matching of names and addresses in the mailing list
- Exclusion of day case patients that stayed overnight

4. Types of minor error

Thirty-eight minor errors were identified during sample checking in 2012, spread across 24 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 PCT coding

Incorrect coding of PCT of referral was found in two samples submitted by trusts in 2012. The problems detected this year were either in relation to missing PCT codes or outdated PCT codes. In previous years there have also been issues with five-digit codes and instances where SHA codes have been used instead of PCT codes.

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 2012 one trust submitted data with an incorrect code in the route of admission data (an internal code of 15 was used instead of the correct code of 11).

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

With respect to errors with coding gender, in 2012 one trust made the mistake of using 'Male' and 'Female' rather than the specified codes of '1' and '2'. Other errors seen in the past are using 'M' and 'F', or submitting samples were 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. In 2012 one trust submitted data which contained a blank column for treatment centre information. Another trust made the mistake of coding all patients as treatment centre patients.

Main specialty miscoding

For the past two survey years no trusts have made errors with regard to the 'main specialty on discharge' data field in the sample file. However, in 2010, errors were found in three samples. Common mistakes were either leaving the column blank or incorrect codes.

Date format used

In 2012 two 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 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'

Incorrect calculations of length of stay were a relatively common source of error in 2012, with six trusts submitting samples containing this error. All trusts were informed of this issue and asked to rectify it before their samples were once again checked to ensure no ineligible patients had been included as a result.

Treatment coding used instead of main specialty code

Although this has not been an issue for a number of years now, in the past some trusts have 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 2012:

Incorrect GMPC Coding: This year General Medical Practice Code (GMPC) was asked for in addition to information already provided in the sample file in previous years. Several trusts (ten in total) submitted samples which contained errors in this field. The main problems were with incorrect codes, where digits were either mistyped (i.e. in the wrong order) or codes such as '0', 'N/A' or 'NULL' had been used. However, one trust submitted GP practictioner numbers rather than GMPC.

Record number formatted incorrectly: Another change for the 2012 inpatient survey is that record numbers are required to be in the format IP12XXXNNNN, where XXX represents trust code and NNNN is a unique 4-digit number, e.g. 0001, 0002, 1003 etc. Five samples were submitted with incorrectly formatted record numbers, which contractors/trusts were asked to amend.

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

