

# 1 Inpatient survey 2007: Sampling Problems

## 1.1 Introduction

For the 2007 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. This document describes the errors made in sampling, divided into major (those requiring re-sampling) or minor (those that could be corrected before final data submission), and the recommendations made by the Co-ordination Centre to correct the sampling. It also discusses the moderate 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.

## 1.2 Major errors

There were 28 major errors noted in the sample checking phase and the Co-ordination Centre advised 23 trusts to redraw their sample (sometimes more than once). This compares favourably to 2006 when there were 38 major errors spread across 28 trusts.

Major problems	2007	2006
Randomised sampling	9	10
Inclusion of maternity patients	8	8
Sampled incorrect period	3	1
Consecutive admissions	2	3
Incorrectly excluded by specialty code	2	4
Zero night stay patients included	2	2
Excluded some hospital sites	1	0
Screened single night stays	1	1
Other	0	9
<b>Total</b>	<b>28</b>	<b>38</b>

## 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 at the start of the month (usually the 1<sup>st</sup> of the month) and the latest date of discharge at the end of the month. As trusts were instructed in the guidance manual to sample backwards from the end of one of three months, it was appropriate to see the last day of the month as the latest discharge date. However, all cases where the earliest date of discharge was in the first few days of the month were investigated further, initially by comparing the 2007 sample to that of previous years, and then contacting trusts to seek resolution and reassurance on the issue.

Nine samples submitted to the Co-ordination Centre were detected as using random sampling methods and these trusts were always instructed to re-draw the sample and resubmit it for final approval. Feedback received from trusts which generated samples using randomisation of

patients suggested the major source of this error is due to new members of staff being given the role of generating the sample without adequate instruction by the staff members who carried out the sampling the previous year and by not fully reading the sampling guidance. We recommend that managers provide members of staff given the task of generating the sample are given enough time to digest the sampling handbook, to generate the sample AND to make any necessary corrections to the sample or to generate a new sample if required.

## Inclusion of maternity 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”.

As in 2006, eight samples were submitted to the Co-ordination Centre containing patients with main specialties of obstetrics or midwifery (ranging from 1-141 affected patients). Trusts were advised that these patients were not eligible for this survey and that a new sample should be drawn excluding patients with specialty codes of 501 and 560.

## Sampled incorrect period

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

- One trust sampled back from the 31<sup>st</sup> July 2007 but had less than 900 eligible patients who were discharged during this selected month. Rather than continuing to sample back consecutively, (i.e. 31<sup>st</sup> August, 29<sup>th</sup> August etc...), the trust included the additional patients from those discharged on the 1<sup>st</sup> and 2<sup>nd</sup> August. The trust was informed that this was incorrect and was able to submit a new correct file, checked by the NHS Strategic Tracing Service (NSTS), within two days
- A second trust submitted a file that contained 19 patients with discharge dates in October, November and December 2007. This was caused by an error during the generation of the sample where patients from October, November and December 2006 were incorrectly recorded as being discharged in 2007 and thus deemed eligible for the sample. These patients were removed from the sample
- The third trust purposefully sampled back from the 27<sup>th</sup> August 2007 instead of the 31<sup>st</sup> August 2007. The trust wanted to sample patients discharged in August but did not want to wait until the trust computer records were updated at the end of August, and felt that these ‘missing’ four days would not make a difference to the final composition of the sample. This trust refused to resample citing no capacity in staff time as the reason. As the trust chose to deviate from the survey guidance and the Co-ordination Centre were unable to exclude the possibility that an event might have occurred at the trust (between 27<sup>th</sup> August and 31<sup>st</sup> August) that would otherwise have a considerable effect on responses to the survey, a formal letter was sent from the Healthcare Commission to the trust to clarify this error.

## Consecutive admissions

Two samples submitted to the Co-ordination Centre had unusually brief maximum lengths of stay (20 and 33 days). When sorted by discharge date (as should have been done to generate the final 850 patients in the sample), the admission dates show a distinct pattern related to the oldest date of discharge. For example, a sample might have a latest day of discharge of 31<sup>st</sup> July and sample back until 12<sup>th</sup> July to generate the sample of 850. When sorted by date of discharge, the oldest date of discharge will only have admission dates for the one day before that, ie all patients discharged on the 12<sup>th</sup> July will be admitted on the 11<sup>th</sup> July (one day length of stay). All those discharged on the 13<sup>th</sup> July will have been admitted on either the 11<sup>th</sup> or 12<sup>th</sup> July, and those discharged on the 14<sup>th</sup> July will have been admitted on either the 11<sup>th</sup>, 12<sup>th</sup> or 13<sup>th</sup> July. This pattern continues until the latest day of discharge (31<sup>st</sup> July in this case), where the dates of admission will range from 11<sup>th</sup>-30<sup>th</sup> July. Patients discharged on the latest date (31<sup>st</sup> July) will always have the longest length of stay in the sample.

This pattern results from when a trust sorts the sample by admission date rather than discharge date, and then selects the first 850 patient for their final sample. This error is very difficult to describe to trusts and, as in 2006, none of the trusts involved thought any error had been made in sampling. In all cases though, we were able to convince the trusts that they had sampled incorrectly and that they needed to resample. The new samples were substantially different from the initial sample and the trusts involved were then able to see there had been an error made.

## Incorrectly excluded by specialty code

Only two samples submitted to the Co-ordination Centre in 2007 erroneously excluded patients from the sample based on the patient's specialty code (compared to four in 2006). One trust excluded all patients with a specialty code of "502 – Gynaecology" to prevent the inclusion of patients admitted for termination of pregnancy (section 10, *guidance manual for the inpatients survey 2006*). While this would certainly exclude all termination of pregnancy patients, it would exclude ALL gynaecology cases, which account for approximately 5% of the total national sample. We confirmed this exclusion based upon specialty code by comparing the 2007 sample to the 2006 sample and then advised the trust that sampling in this manner introduced bias and the sample would not receive approval from the Co-ordination Centre. We advised the trust to be more discriminative when excluding termination of pregnancy cases and the trust confirmed this was possible using other screening criteria on hospital IT systems. The re-submitted file had no errors.

The other trust submitted a sample that was very different from their 2006 sample, with 4.5 times more gastroenterology cases, no geriatric medicine cases and one fifth the number of gynaecology cases. Numerous submissions were made by this trust with dramatic changes to specialty code composition until the problem was resolved. This trust uses treatment codes for patients, and then bands these to the appropriate main specialty code using software. The software was malfunctioning resulting in random allocations. We accepted the final sample and used our own software to recode to main specialty.

## Zero overnight stay patients included

Two trusts included patients with no overnight stays. In both cases, the trusts did not implement the inclusion criteria of having had "at least one overnight stay" as defined in the guidance manual. Both trusts generated a correct sample when notified of this error.

## Excluded some hospital sites

One trust excluded all patients from one hospital site during the generation of its 2007 sample. The Co-ordination Centre was unable to identify this error as we do not ask for the site code(s) to be included in the sample information... However, the trust realised their error after the sample was approved by the Co-ordination Centre and asked to resubmit a new sample to be checked.

## Screened single night stays

One trust made the decision to exclude all patients who only had a single night stay to ensure all patients in the sample had stayed “at least” 24 hours and could appropriately answer the entire questionnaire. In the 2005 adult inpatient survey, three trusts made this error and their survey data could not be used for measurement of performance indicators. The trust re-drew their sample after we discussed this as the most likely result if their sample was not corrected.

## Late start to sampling (and mailing)

One trust did not submit its final sample to the Co-ordination Centre until 6<sup>th</sup> November 2007, more than eight weeks (58 days) after the start date of the survey. The designated member of staff at the trust was provided with the sampling handbook and a timetable by the approved contractor for the task, but soon after this member of staff left precipitously without passing this task onto his colleagues. The deadline to submit this completed file to the contractor passed and the trust were contacted about this. The response from the trust was that they thought the sample had already been generated, checked by NSTS and sent to the approved contractor. Because the sample now needed to be generated quickly, the new staff member who was asked to generate the sample sent the sample to NSTS (by post) in a format that was not acceptable by NSTS. This file was rejected and returned to the trust, as was the next submission. When a file of correct format was finally submitted to NSTS, the sample was checked allowing deceased patients to be removed by the trust. The sample was sent to the contractor for checking and then to the Co-ordination Centre for final checks and approvals prior to mailing.

There were two main issues that resulted in a delay in finalising a sample; inadequate communication between trust and contractor during the sample generation period, and delays in getting final NSTS approval (due to both data quality issues of submitted files and delays in using a non-electronic system for submitting files to NSTS). Communication could be improved by establishing a more regular system of checks between the trust and contractor, or by the contractor having shorter time periods for generation of samples allowing them to contact and assist any trusts that take longer than this and therefore require more assistance. NSTS submission time could be shortened by using an operator experienced with submitting batch traces to NSTS and by using electronic file submission systems such as the PKI uplink provided by NSTS. This shortens the period taken to return the file from one week or more to overnight. We advise that all trusts should investigate this system and have it in place to minimise any delays due to batch tracing using NSTS.

## Postal strike

During the fieldwork period of the 2007 adult inpatient survey, industrial action by Royal Mail staff resulted in two 2-day national postal strikes taking place during the fifth and sixth weeks of fieldwork. Subsequent “wildcat” strikes occurred in some parts of the country, most notably in Liverpool and surrounding areas, with the period of disruption lasting as long as 15 days. Mail strikes also took place during the piloting of the 2007 inpatient survey with two 1-day strikes delaying returns to the postal questionnaire by approximately 1-1.5 weeks. We estimate that the effect of each two day strike was to disrupt mail for approximately 1.5-2 weeks and to discourage

some respondents from participating in the survey. Additionally, the disruption to mail started approximately 2-3 days before each national 1-day strike with few or no questionnaires returned over this period.

While there was no reduction in response rate in any of the pilot trusts due to these two single day strikes, significant effect were noticed in the national survey with delayed returns of questionnaires (by 2-4 weeks) and lower response rates. This was especially noticeable for trusts in proximity to Liverpool due to the extended strike. Further information on the response patterns to the 2007 inpatient survey can be found in the document [“Demographics of respondents and time taken to respond: a comparison of response patterns for the 2006 and 2007 inpatient surveys”](#).

### 1.3 Minor errors

There were half as many minor errors noted in the sample checking phase in 2007 when compared with 2006 (down to 70 from 141 in 2006). We advised 46 trusts that corrections would need to be made to the sample information before the final data set was submitted to the Co-ordination Centre (compared to 80 trusts in 2006).

Minor problems	2007	2006
Incorrect PCT coding	19	30
Incorrect ethnic or gender coding	12	19
Incorrectly calculated Length of Stay (LOS)	11	15
Treatment coding used instead of main specialty	7	16
Date format used	6	22
Main specialty miscoding	6	0
Missing treatment centre data	6	12
Other	3	27
<b>Total</b>	<b>70</b>	<b>141</b>

#### Incorrect PCT coding

Incorrect coding of PCT of residence was again the most common cause of minor errors, and was detected in 19 trusts' samples. The main issues were:

- out-of-date codes
- missing codes
- high proportion of code X98 (Primary Care Trust code not applicable e.g. overseas visitors, Wales, Scotland or Northern Ireland).
- SHA codes used instead
- five digit rather than 3 digit codes used

#### Incorrect ethnic or gender coding

Using alphabetical codes rather than numeric codes for ethnicity or gender occurred in 12 samples. This was pointed out to each of the trusts and was corrected before the final data was submitted to the Co-ordination Centre.

#### Incorrectly calculated Length of Stay

Eleven trusts did not calculate length of stay correctly, down from 15 trusts in 2006. In all cases where length of stay was miscalculated, the Co-ordination Centre would recalculate this then check to ensure that no patients were included that 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.

### Treatment coding used instead of main specialty code

Only seven trusts made the error of submitting treatment codes rather than main specialty code in 2007, down from 16 cases in 2006. Trusts were reminded that the guidance manual specifies that main specialty on discharge is used in the sample information. 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.

### Date format used

It was much less common than in 2006 for dates to be submitted in date, rather than numeric, format as specified in the guidance; six of the 141 minor errors were due to this, compared to 22 in 2006.

### Main specialty miscoding

Six trusts had difficulty correctly coding main specialty on discharge of patients in their sample. Most of these errors presented as simple deviations from the correct format, (ie alphabetical rather than numeric, or more than three digits in length), but one trust incorrectly coded nine patients as “obstetrics” (501) when they were actually gynaecology patients (502). Inclusion of obstetrics patients would qualify as a major error and require these patients to be replaced, but the trust was able to provide evidence to show this was a simple coding error instead.

### Missing treatment centre data

Six trusts did not indicate whether patients had been treated in a “treatment centre”, mostly commonly because trust contacts did not know what a treatment centre was. While six trusts submitted samples without treatment centre codes this year, this was only half as many as in 2006 (12).