

Adult Inpatient Survey 2016: Sampling Errors Report

1. Introduction

For the 2016 Adult Inpatient Survey all trusts were required to submit their samples to the Co-ordination Centre for final quality control checks before mailing out any questionnaires. Final sample data inspection by the Co-ordination Centre was introduced for the 2006 Adult Inpatient Survey and was found to be useful for identifying errors made when drawing samples, helping trusts avoid common mistakes that can result in delays to the survey process and problems with poor-quality data.

This document outlines the types of errors made when samples have been drawn and submitted to the Co-ordination Centre for checking. Sample errors are divided into major (those requiring the sample to be redrawn) and minor errors (those that could be corrected using the same sample). It is important to note that these are only the errors caught by the Co-ordination Centre; many samples would have had errors which were identified during contractors' checks. An overview of Section 251 breaches committed during sample checking is also included.

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

All samples from the 149 trusts taking part in the 2016 Adult Inpatient Survey were checked by the Co-ordination Centre. In 2016 there were 19 major and 40 minor errors noted in the sample checking phase by the Co-ordination Centre.

Table 1 – Frequency of major and minor errors, historical errors and Section 251 breaches

	2016	2015	2014	2013	2012	2011 [†]	2010	2009	2008	2007	2006
Major Errors	19	9	9	16	21	16	9	19	24	28	38
Minor Errors	40	18	25	53	38	11	41	39	70	70	141
Historical Errors*	9	-	-	-	-	-	-	-	-	-	-
Section 251 Breaches[~]	4	11	-	-	-	-	-	-	-	-	-

[†] Please note, in 2011 only in-house trust samples were checked by the Co-ordination Centre.

*Historical errors were not included in the sampling errors report prior to 2016.

[~]Section 251 breaches were not recorded prior to 2015

3. Major errors

If major errors are not corrected, these can invalidate a trust's participation in the survey, meaning that trust's survey data cannot be used by the Care Quality Commission in its assessment of NHS trusts in England. Appendix 1 outlines the frequency of major errors made by error type. A detailed breakdown of the major errors made is provided below.

Inclusion of maternity/termination of pregnancy patients

Six trusts included obstetrics/maternity in their sample data. These patients were all identified in the trust's first sample data submission as they had a corresponding ICD10 chapter code of XV (Pregnancy, childbirth and the puerperium).

Incorrectly excluded by specialty code

Three trusts incorrectly excluded patients with the main specialty on discharge code of 502 (Gynaecology). One omitted code 502 from the extract logic used to draw the sample from their patient record system, whilst other trusts excluded all patients with code 502 as they believed they were all maternity related.

Did not sample consecutive discharges

A central component of the sampling for the Adult Inpatient Survey is that the 1,250 patients used in the sample are selected by sampling consecutive, eligible discharges backwards from the 31st July. Three trusts failed to sample in this way.

Two trusts excluded eligible patients by incorrectly using consultant episode length of stay (the length of time a patient spends in the continuous care of one consultant) instead of spell length of stay (total time an individual spent as an inpatient). In sampling by consultant episode length of stay, patients who had an episode less than one day but a total spell of greater than one day would have been excluded in error.

Another trust appeared to have randomly drawn their sample from individuals who were inpatients during the month of July.

Zero overnight stay patient included

Following initial checks of a trust's sample data submission, it was found that one patient who had a length of stay of zero (no overnight stay) had been included in error.

Inclusion of private patients

Following a query around the submission of an ineligible CCG code ("PP"), one trust identified a privately treated patient as part of their sample. The trust's subsequent sample data submission excluded this patient.

Inclusion of palliative care patients

Following a query around the submission of ineligible Treatment Function Codes (TFC's), one trust identified two patients who were receiving palliative care. The trust's subsequent sample data submission excluded these patients.

Incorrectly excluded by age

Following a query around the lack of patients with a year of birth of 2000, it was found one trust excluded 16 year old patients. This was due to age for inclusion previously being calculated from Date of Birth to Episode End instead of Date of Birth to Sample date.

Exclusion of some hospital sites

Following the inclusion of new hospital site codes in the trust's sample data submission compared to the 2015 sample, it was found a trust had excluded eligible hospital sites. Following discussion with the trust and clarification from the Co-ordination Centre confirming patients should only be included if at least part of their stay had been at an acute centre, it was discovered that community hospital sites had been inconsistently excluded.

Inclusion of overseas patients

One trust included an unrecognised CCG code within their sample ("TDH"). When this was queried with the trust, they found it related to two overseas patients, with no UK address. These patients were subsequently removed for the trust's second submission.

Excluded patients returned as untraceable following DBS check

Demographics Batch Service (DBS) checks are required to ensure appropriate steps are taken to remove deceased patients from a trust's sample. One trust, following completion of their DBS check, had incorrectly excluded untraceable patients (patients whose demographic, address and / or NHS number information could not be matched against the NHS Spine Personal Demographics Service). A trust may take the view that removing untraceable patients safeguard against the possible inclusion of deceased patients. However, such action would result in eligible patients being removed and this could introduce bias.

4. Minor errors

Forty minor errors were identified during sample checking in 2016, spread across 27 trusts. Errors are considered to be minor if they can be corrected without the need for the sample to be re-drawn. Appendix 2 outlines the frequency of minor errors made by error type. A detailed breakdown of minor errors is provided below.

Incorrect CCG coding

Seven trusts were found to have submitted erroneous CCG data. Five trusts submitted CCG data containing incorrect codes. One trust submitted CCG code data in an incorrect format ("SH999" instead of "SH9") and one trust submitted Primary Care Trust (PCT) data instead of CCG code data.

Main specialty miscoding

Six trusts also made errors in the coding of main specialty on discharge (MainSpec) data. Three trusts submitted MainSpec data containing incorrect codes. For two trusts, a high percentage of their sample's TFC data and MainSpec data matched, leading the Co-ordination Centre to query this; one trust reviewed their data and resubmitted with minor amendments, whereas another had extracted episode specialty data instead of the required consultant speciality data. One trust submitted MainSpec data which was inconsistent when compared to the previous year. When queried it was found the trust had submitted their consultant's 'primary' speciality whereas they should have submitted their consultants' 'contracted' speciality.

Missing or incorrect treatment centre data

Five trusts made errors in coding their treatment centre data. These data are used to indicate when a patient has spent any part of their inpatient stay at an NHS treatment centre within the trust. Several trusts submitted data with these codes incorrectly applied and one trust failed to submit data for this variable.

Incorrect ethnic or gender coding

There were four trusts who made errors in the submission of ethnic data. In all cases the error was identified when the percentages of blanks (missing data) and ethnic code "Z" patients (patients who refuses to disclose their ethnicity) were not consistent with the 2015 sample data. Three of the trusts had coded missing data as ethnic code "Z" in error due to a misinterpretation of the two classifications.

Incomplete or invalid treatment function code (TFC) data

New for 2016, trusts were required to submit TFC data in addition to MainSpec data. Four trusts made errors in the submission of this data.

Two trusts submitted data containing invalid TFC codes; one of these trusts corrected this as part of a second sample data submission while the other trust was advised to amend their single incorrect record prior to final data submission.

A further trust did not submit TFC data for four patients. This trust was advised to submit complete TFC data for all participants as part of final data submission.

Another trust submitted MainSpec data instead of TFC data and was subsequently required to resubmit their sample data.

Incorrectly calculated 'Length of Stay' (LoS)

Three trusts incorrectly calculated patients' LoS. Two trusts incorrectly used consultant episode LoS (the length of time a patient spends in the continuous care of one consultant) instead of spell LoS (total time an individual spent as an inpatient). This in turn caused the discharge dates to be incorrect. One trust incorrectly stated a patient's LoS had been six days when it should have been seven days. No resubmission was required in this instance and the trust was advised to amend the sample data prior to final sample data submission.

Record number formatted incorrectly

Three trusts made errors when applying the unique record number (URN) convention. One trust incorrectly used the URN convention **IPXXXNNN** instead of **IP16XXXNNNN**. This was corrected following resubmission of sample data due to other errors. One trust included one number to many in their URN convention; **IP16XXXNNNNN** instead of **IP16XXXNNNN** and another trust used the URN convention from the 2015 survey; **IP15XXXNNN** instead of **IP16XXXNNN**. Both of these trusts were advised to amend the samples URN conventions prior to final data submission.

Incorrect site codes

Three trusts submitted data containing incorrect site codes for either admission or discharge. When the Co-ordination Centre queried fluctuations in activity at a trust's sites, it was found a new reporting tool used by the trust had given incorrect information. A second data submission amended the site codes. One trust used the organisation code (used to indicate an entire trust) instead of the trust's own individual site code and one final trust included the invalid code "other" instead of a correct site code.

Missing or incorrect route of admission data

Two trusts made errors in their route of admission data, which is used to indicate whether a patient was admitted to hospital as an elective, emergency or transferred admission. One trust failed to include an admission code for one patient and another trust had incorrectly coded a patient's route of admission as code '83', an invalid code.

Missing or incorrect ICD-10 chapter code data

Two trusts made errors in their ICD-10 chapter code data. One trust submitted incorrect ICD-10 chapter codes. A second submission by the trust corrected this error. Another trust included an incorrect ICD-10 chapter code for one patient included in the sample. Advice was given to correct this prior to final data submission by the Co-ordination Centre.

5. Historical errors

In checking the samples for this year's survey, it became apparent that the samples of eight trusts submitted for the 2015 survey had been incorrectly drawn. If this is determined to be a major error, comparisons with the 2015 data may not be possible. The historical data may also be excluded from other uses, such as in CQC's intelligence model, as well as by other organisations such as NHS England for use in their national statistics.

Appendix 3 outlines the frequency of historical errors made by error type. A detailed breakdown of historical errors is provided below.

Excluded eligible patients

Three trusts were found to have directly excluded eligible patients in their 2015 sample data as a result of their error. One trust believe they accidentally deleted data or excluded patients from the 2015 data as a result of human error. Data comparison to the 2016 sample data showed the 2015 sample to be over-represented by planned admissions, younger patients and patients with shorter lengths of stay as a result of the error.

One trust applied a different inclusion / exclusion criteria for 2016. As a result the trust excluded multiple eligible patients, most notably patients with Treatment Function Codes '502' (Disorders of the female reproductive system) and '503' (Services to treat cancers of the female reproductive system). Comparisons to the 2016 sample data showed the 2015 sample to be over-represented by male patients as a consequence of the error.

Another trust was found to have an error in their extract code that excluded patients treated under MainSpec code '326' from their 2015 sample data. Further analysis showed no patients with the MainSpec '326' were included in the 2014 sample either.

Used a randomised sample method

Two trusts used a randomised sample method instead of drawing their sample using consecutive discharges. One of these trusts used a randomised method in both the 2014 and 2015 sample datasets. In 2015 the trust also attempted to skew the sample data towards certain specialties as a result of a query raised by the Co-ordination Centre. As a result of the errors the 2014 and 2015 samples were over-represented by patients with planned admissions and patients with longer stays in hospital.

The other trust randomly drew their sample from patients discharged during the whole of July. In contrast to the above trust, only small variations between the 2016 and 2015 data were found. As there was no evidence that the 2015 sample had been biased, the trust was allowed historical comparisons to their 2015 data.

Incorrectly ordered by admission date

One trust incorrectly ordered by admission date in the 2015 sample. Following queries around very low lengths of stay in the 2015 sample data, the trust confirmed that their data

had been ordered by admission date instead of discharge date when reducing their eligible population to the desired sample size. This resulted in eligible patients with longer lengths of stay to be excluded in error.

Incorrectly included / excluded hospital sites

One trust incorrectly excluded hospital sites from their 2015 data. Differences between the 2015 and 2016 sample data show the trust had excluded eligible patients who were used community hospital sites as well as acute hospital sites as part of their inpatient care.

Incorrect length of stay (LoS) used to draw sample

One further trust drew their 2015 sample using first consultant episode LoS instead of spell LoS. In doing so patients who completed their first consultant episode within 24 hours of admission (i.e. placed under the care of a different consultant within 24 hours of admission) but remained inpatients would have been excluded in error. Put into context, 7.1% of patients completed their first consultant episode within 24 hours in the 2016 sample.

6. Section 251 Breaches

Approval for the NHS Adult Inpatient Survey 2016 was sought under Section 251 of the NHS Act 2006. This approval allows the common law duty of confidentiality to be put aside in order to enable the processing of patient identifiable information without consent. Any breaches of the conditions for Section 251 approval are communicated to the Care Quality Commission, who in turn notifies the Confidentiality Advisory Group (CAG) of the breach.

This year there were four trusts that committed Section 251 breaches. These errors consisted of one or more of the following breaches of information security guidelines:

- Transferred data prior to notification that the sample declaration form had been approved
- Transferred mailing and sampling data in a combined file, in contravention of the instructions
- Transferred data as email attachments and/or without the sufficient level of encryption.

Appendix 1

Table 2 – Frequency of major errors made by error type

Major errors	2016	2015	2014	2013	2012	2011 [†]	2010	2009	2008	2007	2006
Inclusion of ineligible patients											
Inclusion of ineligible patients (based on route of admission information)	0	0	3	3	6	6	6	5	n/a	n/a	n/a
Zero overnight stay patients included	1	0	1	0	3	2	0	1	0	2	2
Inclusion of private patients	1	0	0	1	2	0	0	0	3	0	1
Inclusion of maternity/termination of pregnancy patients	6	5	1	0	1	2	0	0	2	8	8
Inclusion of psychiatry patients	0	0	0	0	0	0	0	0	1	0	0
Inclusion of overseas patients	1	0	0	0	1	-	-	-	-	-	-
Inclusion of patients both admitted and discharged from a community hospital	0	0	0	1	1	-	-	-	-	-	-
Inclusion of deceased patients	0	1	-	-	-	-	-	-	-	-	-
Inclusion of palliative care patients	1	-	-	-	-	-	-	-	-	-	-
Exclusion of eligible patients											
Incorrectly excluded by specialty code	3	0	0	8	0	0	0	0	0	2	4
Screened single night stays	0	0	0	1	0	1	0	2	0	1	1
Incorrectly excluded by age	1	0	0	1	1	1	0	1	4	0	1
Exclusion of some hospital sites	1	0	0	0	0	0	0	0	1	1	0
Exclusion of eligible patients due to mistake in query used to extract patient list	0	2	0	0	2	-	-	-	-	-	-
Exclusion of particular CCG codes	0	0	0	0	1	-	-	-	-	-	-
Exclusion of day case patients that stayed overnight	0	0	0	0	1	-	-	-	-	-	-
Excluded patients returned as untraceable following DBS check	1	-	-	-	-	-	-	-	-	-	-
Other											
Did not sample consecutive discharges	3	1	0	1	0	2	3	7	9	11	13

Sampled incorrect period	0	0	1	0	1	0	0	2	3	3	1
Misaligned sample fields	0	0	3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mismatching of names and addresses in the mailing list	0	0	0	0	1	-	-	-	-	-	-
Other - Unspecified*	0	0	0	0	0	2	0	1	1	0	7
Total	19	9	9	16	21	16	9	19	24	28	38

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

*Before the 2012 report, the contents of the 'other' category were not specified.

Appendix 2

Table 3 – Frequency of minor errors made by error type

Minor errors	2016	2015	2014	2013	2012	2011 [†]	2010	2009	2008	2007	2006
Incorrect CCG coding	7	4	2	16	2	3	15	9	26	19	30
Missing or incorrect route of admission data	2	0	0	1	1	1	8	10	8	n/a	n/a
Incorrect ethnic or gender coding	4	2	2	9	6	1	5	7	18	12	19
Missing or incorrect treatment centre data	5	3	1	1	2	2	4	5	1	6	12
Main specialty miscoding	6	3	0	7	0	0	3	1	4	6	0
Date format used	0	0	0	0	2	1	3	0	3	6	22
Incorrectly calculated 'Length of Stay' (LOS)	3	0	0	3	6	0	3	5	9	11	15
Treatment function code data used instead of main specialty*	N/A	0	7	5	0	0	0	0	1	7	16
Incomplete or incorrect treatment function code data	4	-	-	-	-	-	-	-	-	-	-
Missing or incorrect ICD-10 chapter code data	2	3	-	-	-	-	-	-	-	-	-
<i>Sub-total of named minor errors</i>	<i>34</i>	<i>15</i>	<i>12</i>	<i>42</i>	<i>19</i>	<i>8</i>	<i>41</i>	<i>37</i>	<i>70</i>	<i>67</i>	<i>114</i>
Other (broken down for 2012 onwards):											
Incorrect month of admission	0	1	-	-	-	-	-	-	-	-	-
Incorrect DoH trust code	0	-	-	2	-	-	-	-	-	-	-
Record number formatted incorrectly	3	-	10	1	5	-	-	-	-	-	-
Incorrect site of admission/discharge codes	3	-	3	8	4	-	-	-	-	-	-
Incorrect GMPC coding	0	-	-	-	10	-	-	-	-	-	-
Insufficient sample size	0	2	-	-	-	-	-	-	-	-	-
<i>Sub-total of 'other' minor errors</i>	<i>6</i>	<i>3</i>	<i>13</i>	<i>11</i>	<i>19</i>	<i>3</i>	<i>0</i>	<i>2</i>	<i>0</i>	<i>3</i>	<i>27</i>
Grand total	40	18	25	53	38	11	41	39	70	70	141

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

*Note that as of 2016, treatment function codes are required data for the Adult Inpatient Survey and is now submitted alongside main specialty on discharge data.

Appendix 3

Table 4 – Frequency of historical errors made by error type

Historical errors	2016	2015	2014	2013	2012	2011[†]	2010	2009	2008	2007	2006
Excluded eligible patients	3	-	-	-	-	-	-	-	-	-	-
Used a randomised sample method	2	-	-	-	-	-	-	-	-	-	-
Incorrectly ordered by admission date	1	-	-	-	-	-	-	-	-	-	-
Incorrectly included / excluded hospital sites	1	-	-	-	-	-	-	-	-	-	-
Incorrect length of stay (LoS) used to draw sample	1	-	-	-	-	-	-	-	-	-	-
Total	8	-	-	-	-	-	-	-	-	-	-

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

*Historical errors were not included in the sampling errors report prior to 2016.

Appendix 4

Table 5 – Frequency of Section 251 breaches by type

Section 251 breaches	2016	2015*	2014	2013	2012	2011[†]	2010	2009	2008	2007	2006
Released patient identifiable information											
Misaligned patient names and addresses	0	1									
Submitted full date of birth	0	2									
Transferred mailing and sampling data in a combined file.	1	3	-	-	-	-	-	-	-	-	-
Covering letters sent for Co-ordination Centre checks contained patient names and addresses	0	1									
Other											
Transferred data prior to notification of sample declaration approval	1	0	-	-	-	-	-	-	-	-	-
Began mailing without co-ordination centre approval	0	1	-	-	-	-	-	-	-	-	-
Data which should only be submitted to the Co-ordination Centre sent to contractor	0	2	-	-	-	-	-	-	-	-	-
Transferred data as email attachments and/or without the sufficient level of encryption.	2	1	-	-	-	-	-	-	-	-	-
Total	4	11	-	-	-	-	-	-	-	-	-

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

*Section 251 breaches were not recorded prior to 2015.