



# **Emergency Department Survey 2016: Sampling Errors Report**

**The Co-ordination Centre for the NHS  
Patient Survey Programme**

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## Updates

Before using this document, please check that you have the latest version, as small amendments are made from time to time (the date of the last update is on the front page). In the unlikely event that there are any major changes, we will e-mail all trust contacts and contractors directly to inform them of the change.

This document is available from the Co-ordination Centre [website](#).

## Questions and comments

If you have any questions or concerns regarding this document, or if you have any specific queries regarding the submission of data, please contact the Co-ordination Centre using the details provided at the top of this page.

## Contents

1. Introduction .....	4
2. Sampling Methodology.....	5
3. Frequency of Errors .....	6
4. Major Errors .....	8
5. Minor Errors .....	10
6. Section 251 Breaches.....	12
7. Historical Errors .....	13

## 1. Introduction

All of the 137 trusts participating in the Emergency Department Survey 2016 (ED16) were required to submit their sample data to the Co-ordination Centre at Picker for final quality control checks before the mailing out of questionnaires. Sample data inspections of this kind were first introduced by the Co-ordination Centre for the Adult Inpatient Survey 2006, and were subsequently found to aid trusts in avoiding common mistakes when collating their sample data. Such mistakes may lead to delays in the survey process and poor data quality.

This document outlines the errors identified by the Co-ordination Centre in the sample drawing process undertaken by NHS trusts. It should be noted that this report only details the errors detected by the Co-ordination Centre; there will have been a number of errors made by trusts which were identified by survey contractors through their own checks. In addition, this report also contains an overview of the Section 251 breaches that occurred during the sample checking process.

This document should be used by both trusts and contractors alike in order to familiarise themselves with past errors in an attempt to prevent them from reoccurring. If further assistance is required, please contact the Co-ordination Centre on 01865 208127.

## 2. Sampling Methodology

The sampling methodology used in ED16 was different from that used in previous iterations of the survey, and this resulted in a number of sampling errors.

This methodology first involved compiling a list of all eligible individual attendances to departments during September 2016. This list had to then be sorted sequentially, first by department type, then gender, followed by year of birth, and finally by CCG code.

The third step involved drawing the actual sample from the list of all attendances, and this is where a large number of errors occurred. This was largely due to ED16 using stratified sampling, compared to the random sampling method used in the Accident and Emergency Survey 2014. The interested reader is advised to consult the Quality and Methodology Report for a full explanation of the methodology used for ED16; the report is available [here](#).

### 3. Frequency of Errors

A number of errors were identified in the sample data ED16 ([figure 1](#)), and were categorised as major, minor, and section 251 errors. In addition, some historical errors were detected when comparing ED16 sample data with that from previous iterations of the survey

Major errors require the sample and/or eligible population to be redrawn if ineligible patients have been included or eligible patients have been excluded. If these cannot be corrected, then they result in the trust responsible being excluded from the survey due to the Care Quality Commission (CQC) being unable to use said trust's data. It is therefore important to identify them as early as possible so that trusts can resample if need be.

Minor errors do not require the sample to be redrawn, but instead require amendments to be made to the sample data. Errors are considered to be minor if the trust's sample is comprised of eligible patients and can be corrected without the need for the sample to be re-drawn.

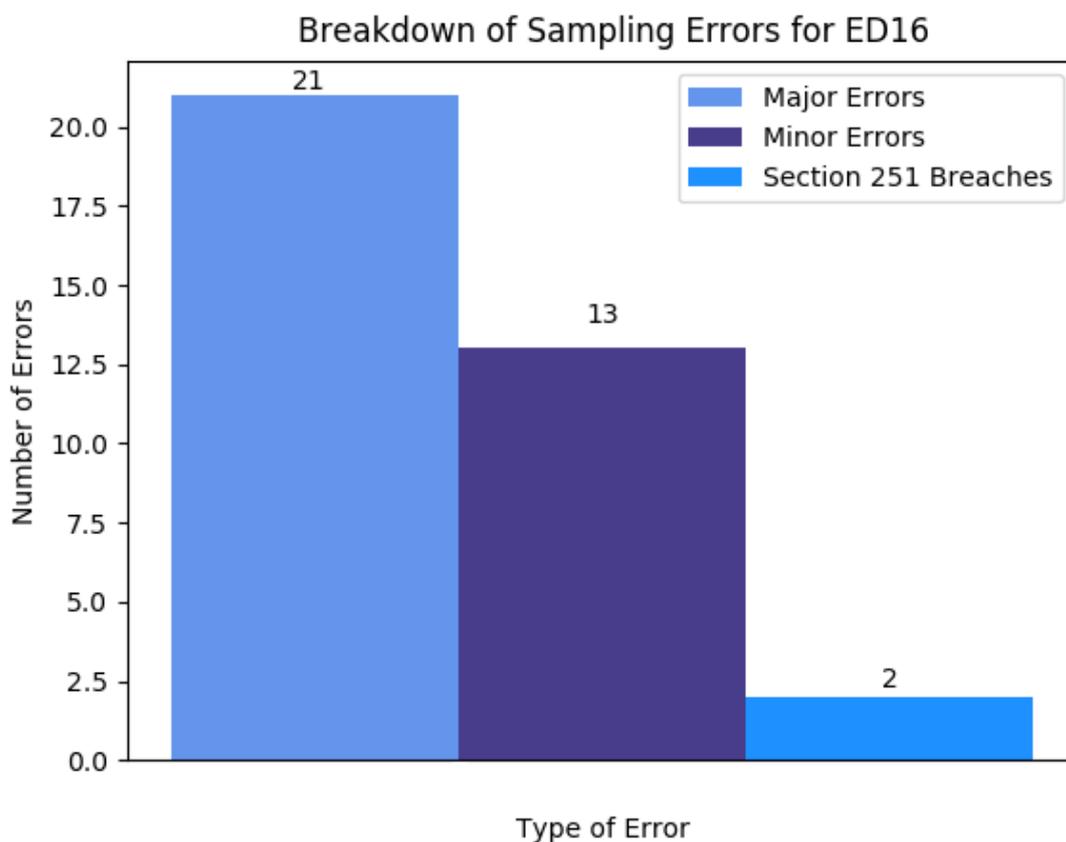


Figure 1: Breakdown by type of errors encountered by the Co-ordination Centre during ED16 data sample checking.

Section 251 errors refer to breaches under Section 251 of the NHS Act 2006, in which the common law duty of confidentiality is put aside in order to allow for the processing of patient identifiable data without consent.

Historical errors refer to errors made during previous survey iterations. These are important to note as, if any of these errors are deemed to be major ones, then historical comparisons may not be an option for the trust in question.

## 4. Major Errors

In total, there were 20 individual major errors made during sampling for ED16, which resulted in re-submissions of sample data and attention being drawn to 3 historical errors made during The Accident and Emergency Survey 2014 (AE14).

### Major Errors with CCG Codes

One trust included eight patients with CCG codes of 'VPP', which are private patients. This resulted in the trust having to re-sample.

### Major Errors with Initial Attendance List

Whilst correctly performing the above steps in order to formulate a complete and correct sample of eligible patients, two trusts made errors in constructing the initial list of attendances to their emergency departments. One of these trusts failed to include all of the eligible patients in their initial sample selection due to a copying error. Similarly, the other trust experienced human error in copying patient records from the patient admission system export into the sample workbook, which resulted in roughly 3000 records accidentally being missed out. Both trusts had to re-sample.

Another trust found that their data look-up routine had been corrupted, resulting in them not being able to accurately track patients to their NHS hospital sites. This affected all of their records, and resulted in the trust having to re-sample.

While checking the second sample to be drawn for one particular trust, it was established that the patient list from which this second sample was drawn did not include all attendances during the sampling period. Moreover, it consisted solely of the most recent attendances, resulting in the need for a re-sampling.

### Major Errors with Department Type

One trust had a sample that had a number of issues in regards to Type 1 and Type 3 patients. For a trust that has both a type 1 and type 3 department, a complete sample dataset for ED16 should consist of 950 Type 1 patients, and 300 Type 3 patients. The sample submitted by this trust had 929 and 321 patients, respectively. Furthermore, although Type 1 patients were assigned the correct trust code, Type 3 patients were assigned a trust code that did not exist.

Another trust did not include any type 3 patients, despite having a type 3 department. The trust had to subsequently resubmit their sample data to include these patients.

### Major Errors with Patient Record Numbers

One trust submitted a sample where the patient record numbers were in sequential order. This should not be the case if the sampling instructions had been followed correctly, as they state how the record numbers should be assigned after sorting the eligible population data, but before drawing the sample population.

### Major Errors Leading to Biased Samples

A trust failed to sort their patient list prior to sampling, and this resulted in a disproportionate sample being drawn from the trust's attendance list as the necessary strata were not created in order for the stratified sampling method to be applied correctly. The trust had to therefore re-sample.

Two trusts removed duplicate patients before drawing their sample, which due to the nature of stratified sampling and its dependence upon exhaustive sub-groups, resulted in a biased sample. In one trust, this characterised itself as spikes in attendances on specific days. In the other trust, this issue was characterised by an increase in age groups when compared to sample data from AE14. Both trusts subsequently re-sampled.

Another trust failed to sort their initial patient list in the manner detailed above, and then drew their sample randomly, rather than using the stratified sampling method. Similarly, a different trust incorrectly sorted their patient list in order of attendance, and failed to randomise their sample in the systematic manner required. These errors resulted in both trusts having to re-sample due to biased data.

One trust had to re-sample a third time, and in checking this new sample, a query was raised regarding a significant shift in the ratio of males to females. In response to this query, the trust stated that they had uncovered a number of errors in their extract coding, and therefore opted to redraw their sample. This fourth sample was accepted.

#### Major Errors in Excluding Eligible Attendances

Following a query raised by the Co-ordination Centre in regards to a drop in attendance on a specific day during the sampling period, it emerged that one trust had excluded eligible patients. Specifically, the trust created a source table for all attendances during the sampling month, from which they drew their sample, and where the exclusion criteria was applied. The implementation of these exclusions inadvertently excluded any patients with “NULL” in the ‘Diagnosis’ field.

A different trust had to re-sample after it emerged that they had excluded patients with missing ethnic data from their sample submission. Another trust submitted a sample that was drawn using a script that excluded a number of eligible groups, and therefore creating a biased sample; requiring them to re-sample. Similarly, a trust had to resubmit their sample after realising that their data querying method was incorrect, which resulted in the sample data being skewed with a disproportionate number of males included.

A separate trust had to re-draw their sample after it was confirmed that their original sample had excluded attendances that were referred to outpatient clinics.

#### Major Errors in not Excluding Ineligible Attendances

It was found that the second sample of a particular trust had correctly excluded patients under the age of 16, but had not excluded any other ineligible groups. This was due to the trust being unable to identify these other types of ineligible patients, and resulted in the trust having to resample.

## 5. Minor Errors

In total, there were 12 individual minor errors made during data sampling for ED16, two of which resulted in re-submissions. These errors were made in a number of areas.

### Minor Errors with Record Numbers

Each entry in the initial attendance list is assigned a unique reference number (URN). These take the form of ED16XXXNNNNN, where 'ED16' refers to the survey name, 'XXX' the trust code, and 'NNNNN' a collection of integers which run sequentially from 00001 to the total number of records in the attendance list. Two trusts, after initially numbering each attendance correctly and drawing their sample data, re-numbered their patient records so that they were sequential in the drawn data sample. Due to the fact that the order of the sample URNs constitutes an important check in ensuring that the stratified sampling methodology has been applied correctly, these trusts had to re-sample.

A different trust submitted a sample whereby the patient numbers were one integer shorter than they should have been.

In another case, the sample data was correct when submitted to the contractor, but a patient record number was accidentally changed during file preparation, which resulted in there being two duplicate record numbers. The record in question was amended.

### Minor Errors with Department Type

One trust coded a Type 1 patient as being a Type 3. This was corrected by the trust removing this particular patient and resubmitting their sample.

### Minor Errors with CCG Codes

One trust used an incorrect CCG code, this was amended. Another trust had two records with incorrect CCG codes. These two records were amended and the same sample data re-submitted.

### Minor Errors with Sample Extraction

After a query raised by the Co-ordination Centre regarding exceptionally low attendance on a specific day, it emerged that that trust had not updated their table correctly for the last day of the sampling period. The trust corrected this and re-submitted their sample.

### Minor Errors with Gender

One trust incorrectly assigned two patients the wrong gender code (e.g. a male patient was coded as '2 – Female'). This was amended without any further issues.

### Minor Issues with Time of Attendance

In their second submission, a different trust's 'time of attendance' data was in the incorrect format.

### Minor Issues with Ethnicity

A query was raised by the Co-ordination Centre concerning how a particular trust apparently no longer distinguished between blanks and code 'Z'. The trust indicated that this was not the case, and that they had distinguished between the two. Their instructions, however, told them to combine the two codes. These ethnicity codes were subsequently recoded, and the sample re-submitted.

Finally, there were two trusts that coded missing ethnic codes in their sample as 'Z' due to their system not accepting 'blanks' as a valid option. These particular cases were recoded to 'Z'. The coding of blanks and Z's, in this instance, has no impact on the analysis, and was therefore not considered to be a priority.

## 6. Section 251 Breaches

Approval for ED16 was sought and gained under Section 251 of the NHS Act 2006. This approval allows the common law duty of confidentiality to be put aside in order to allow for the processing of patient identifiable data without consent. Any breaches of the terms and conditions of Section 251 approval are immediately communicated to the CQC, who in turn, notify the confidentiality Advisory Group (CAG) of the breach in question.

During the course of ED16, there were two Section 251 breaches. The first took the form of confidential, and patient identifiable, data being attached to an email by a trust and sent to their approved contractor without any further security procedures or encryption. The second occurred when a trust missed a step in preparing their sample, and as a result, included the NHS number for each of the patients in their sample.

## 7. Historical Errors

The sample checking process carried out by the Co-ordination Centre involves comparing trust sample data to that from previous iterations of the survey, so as to help ensure that the sample has been drawn correctly. For ED16, sample data was compared to that submitted for the Accident & Emergency Survey 2014 (AE14). On occasion, these checks can unearth errors made during these previous survey iterations. These are important to note as, if any of these errors are deemed to be major ones, then historical comparisons may not be an option for the trust in question.

Due to changes made for ED16, it was deemed inappropriate to conduct historical comparisons to previous survey iterations. As such, it was not necessary to undertake an in-depth investigation into potential historical errors, beyond those required in order to validate the sample data for the current iteration. Despite this, five historical errors were observed during this sample checking process for ED16.

- One trust excluded attendances that were later referred to outpatient clinics in their AE14 sample.
- As mentioned above, one trust had an issue in that their extract logic which resulted in a skewed sample when collecting data for ED16. Given that the same piece of code was used for AE14 sample collection, it is likely that a similar error occurred in this previous iteration of the survey.
- It is likely that one of the other aforementioned trusts that failed to apply the exclusion criteria correctly also made a similar error in AE14.
- Following queries raised by the Co-ordination Centre in regards to another sampling issue, it emerged that one trust is likely to have committed a sampling error in 2014 in regards to both age and ethnic groups, as these seem to differ between the sample and the population-level data for the trust.
- There are also two trusts that appear to have made an error in their AE14 sample data; one with the gender split of the sample, and the other with the assignment of ethnic categories. However, due to a turn-over of both staff and computational systems, it has proven difficult to ascertain the ultimate cause of these two errors.