# The National Congenital Heart Disease Database Data Quality Audit

## An Introduction to the Process

### 1. Background

The National Congenital Heart Disease Audit (NCHDA) system has been designed to collect clinical data based directly on the clinicians own view of their activity and, through the use of a standard mapping of diagnoses and procedures, to enable clinicians to evaluate and peer review their performance in a highly specialised area of clinical care.

The Data Quality Audit review has been designed to support this aim by providing a tool by which Trusts supported by NCHDA staff can work together to produce the high quality paediatric clinical data required for meaningful analysis and comparison.

The Data Quality Audit process comprises of 3 complementary stages. These are a baseline assessment (the checklist review), a site visit and an external validation of the completeness of the data collection.

### 2. Data Quality Criteria

The Data Quality Audit contains seven Data Management Quality Criteria:

| Criterion | Definition |
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| 1. Security and Confidentiality | There must be effective arrangements to secure compliance with statutory and other law, central guidance and NHS Standards on securing and maintaining the confidentiality of patient data. |
| 2. Coverage | Data should be collected for all activity. |
| 3. Validation and Quality Assurance | The Trust should have a comprehensive validation programme including formal computer procedures and validation of data with the source. |
| 4. Training | All staff involved in capturing and managing data and information should receive relevant introductory and continuing information. |
| 5. Communications | There should be procedures for the dissemination of data and information to those with a requirement for it. |
| 6. Accountability | There should be clear accountability for data quality. |

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| 7. Health Records Management | The Health Records function should be efficient and effective. |

And three Data Output Criteria.

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| 8. Timeliness | Validated data should be available for use at the time it is required. |
| 9. Completeness and Validity | All key data items in a record should be complete and in valid formats as defined in the NHS Data Manual and the NCHDA standards. |
| 10. Accuracy | Data collected should correspond with actual events. |

## 3. Review Stages

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| Project Initiation | Agree date of visit with Trust |
| Checklist Review | A brief high-level review to establish that good quality procedures are in place.<br><br>Aims & Objectives<br>Enables an assessment of Data Management processes prior to the site visit.<br><br>To verify:<br>• compliance with Data Protection Act / Legislation<br>• existence of documented data management procedures<br>• arrangements for data audit, validation and quality control, accountability and communications<br>• whether it is appropriate to undertake the Data Quality Audit at this time. |
| Site Visit | a) A detailed review of the processes and procedures used to ensure consistent good practice.<br>b) An audit of NCHDA data against a sample of casenotes.<br><br>Aims & Objectives<br>To assess data processes and identify any actions needed. To assess the quality of the data generated. |
| External Validation | A comparison of NCHDA activity and Trust activity<br><br>Aims & Objectives<br>To validate the completeness of NCHDA activity against the most accurate available external reference. |

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| Final Report | An objective report identifying the quality of the NCHDA data as assessed against explicit data quality criteria.<br><br>Aims & Objectives<br>To confirm good practice, and identify areas which require attention, in the recording of clinical activity.<br>To ensure the validity of any decisions made based on the clinical information provided by the NCHDA system. |

## 4. Data Analysis

### Internal Validity

The completeness and validity of data recorded on the NCHDA system is assessed by auditing NCHDA datasets against the casenotes using a sample which is representative of the clinical activity within the department.

### External Validity

Data completeness is externally (relative to NCHDA) validated by comparison with Trust activity returns. Whilst this may not be 100% accurate and may reveal deficits in either direction it is essential that some attempt is made to validate the total activity count.

### Data Quality Indicator (DQI)

The conceptual basis for this DQI is explained in the 1998 -1999 Data Quality Indicator Methodology Paper (DoH)

The DQI is produced by taking the mean of the 4 NCHDA domains:

- demographics
- pre-procedure
- procedure
- outcome.

Each domain is measured in a range from 1.00 to zero where 1.00 indicates that ALL records within the organisation have valid codes in ALL the fields used to form that particular domain.

If any of the fields within the record contain invalid or missing values, a counter is incremented by 1. The domain is then scored by calculating the proportion of records where all the fields have valid values i.e

$$1 - \frac{\text{number of records with any invalid value}}{\text{total number of records examined}}$$

For example, if a Trust had 40 records and 10 of them were found to contain an invalid value in one or more of the above fields, then the component score is 1- (10/40) = 0.75

The DQI is simply the average of all the domains, expressed as a percentage.

For example, if the same Trust had scores of:

| | |
|---|---|
| Demographics | 0.75 |
| Pre-procedure | 0.95 |
| Procedure | 1.00 |
| Outcome | 1.00 |

$$\text{The DQI is } \frac{(0.75 + 0.95 + 1 + 1)}{4} \times 100 = 92.5\%$$

The principal advantages of this DQI is that it identifies the nature of any prevailing data issues.

**Example**

This example shows how the DQI will work.

| | DQI % | Demographics | Pre- Procedure | Procedure | Outcome |
|---|---|---|---|---|---|
| Trust A | 80 | 1.00 | 1.00 | 0.00 | 1.00 |
| Trust B | 80 | 0.70 | 0.70 | 0.70 | 0.90 |

Both the Trusts have scored 80% for the DQI. This suggests that they both have a data quality problem. However, a look at profile of the domains shows that the problems they have are quite different.

Trust A generally has excellent data quality but has a problem with at least one of the fields that comprise Domain 3. The problem is so severe that all records are failing, which suggests some systematic error. This may be quite easy to put right once located. However, in the meantime, analyses that do not involve the fields used in Domain 3 are looking very reliable.

Trust B on the other hand is looking generally mediocre. There is no obvious problem. It could indicate that local codes were not being correctly mapped to the national ones. Whatever it is, there is lack of confidence at this point in any analyses resulting from this Trust's data.