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NHS CONFEDERATION

The non-executive directors' guide to hospital data

Part four: How to make good use of data – quality and safety, including mortality, activity data, contracting and finance

Key points

- Many indicators can be used to monitor quality and safety. They should not be considered in isolation.
- The quality of indicators is inextricably linked to the quality of data.
- The accurate coding of clinical activity is fundamental, particularly when constructing mortality rates.
- Good clinical coding is also crucial in determining the right level of payments for healthcare services, and thus defining NHS tariffs.

Understanding your organisation's data is an essential part of providing effective oversight. But data may not always give you the complete picture and it is important to first understand what data is available, how it is recorded and what these records are used for.

This *Briefing* will help non-executive directors (NEDs) better understand NHS data and how it can be used to determine what is going on in their hospital. For the purposes of this *Briefing* we examine data in the acute care setting only. Data is of course collected in primary care by GPs, pharmacists, dentists and opticians, but the various datasets are not linked by the NHS.

This *Briefing* looks at how to make good use of data across: quality and safety, including mortality; activity; contracting; and finance. It also includes a short technical guide on ICD-10, OPCS-4 and healthcare resource groups (HRGs).

How to make good use of data

Data, by its nature, is something that should be handled carefully. NHS data is no exception and non-executive directors need to be aware that they have to ask the right questions in order to establish what the data is telling them. The questions are simple

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and straightforward. For instance, do our emergency admissions figures include mothers and babies? Without answers to these questions the data cannot be interpreted correctly.

We have already highlighted the sort of questions that can be asked of NHS data in parts one, two and three of this series. We now turn to how the data can be used to help trusts improve the quality and safety of the services they provide.

Quality and safety

There are many indicators that can be used to monitor the quality and safety of care provided by a hospital trust. However, there is no single 'dashboard' that should be used; the recommendation is that trusts monitor a wide spread of indicators and consistently track these over time.

Although this intelligence is useful, it is one dimensional. The board can only see how the trust is performing in isolation. Benchmarking is required to assess performance within, and across, the healthcare system. There is, understandably, a growing market for benchmarking services. Providers work with trusts to make sure they are comparing like with like, and peer group comparison shines a light on the areas where improvements can be made.

However, non-executive directors need to be aware that in order to benchmark data a number of things have to happen. First is adjustment of the raw numbers. At its simplest level, this is for the size of the hospital trust and the number of patients that it delivers care to in comparison to other trusts (turning "raw" scores into rates, for example, the number of events per 1,000 patients).

The next stage of refinement is the construction of risk-adjusted indicators. Risk adjustment is the process of adjusting for risk factors (which might explain variation in outcome) so that comparison can be made. In essence, the adjustment is not only for the volume of patients seen but also key characteristics which would affect the indicators (such as age, diagnosis, co-morbidities and procedure). Adjustment can be made for a number of indicators, including length of stay, readmissions and mortality. Although it sounds straightforward, performing clinically credible risk adjustment is difficult and there are different ways of adjusting for risk. The following example explains the basics.

Key questions for NEDs to ask

- Do we have a collaborative approach between clinicians and coders to ensure the data we hold is accurate?
- Is there a robust clinical governance process in place regarding the review of mortality to provide assurances to the board?
- Do we have mortality sub-groups in place within our organisation?
- Are readmission cases a result of the quality of care we provide or a lack of community services for the treatment of certain conditions?
- Are we monitoring the same range of quality and safety indicators over time?
- Do we benchmark our performance against other providers?

Risk adjusted readmissions within 30 days

This indicator is the relative risk of readmission within 30 days. It is the ratio of the observed number of readmissions to the expected number of readmissions (taking into account the various risk factors). This ratio is then multiplied by 100. The factors that will influence the ratio are:

1. The accuracy of the observed number of readmissions

This sounds like it should be a simple count: how many people have come back as an emergency admission within 30 days of discharge? However, the rules for this indicator, used for the current financial penalty, include people who end up being admitted to a different hospital within the 30 day period, which your staff will not be able to 'see' until the central data lets them know.

2. The way the expected number of readmissions is calculated

There is no one single 'correct' way to predict the expected number. It relies on having a good understanding of the way services are provided. For instance, are there any sub-groups who should be excluded for specific reasons? Looking at readmissions, many cancer treatments are not carried out to a fixed timetable so patients might appear as readmissions when they are on a known treatment pathway and potentially should be excluded from this indicator. The calculation then requires the use of good statistical methods to make the 'best' prediction – but it is possible for two different answers to be produced, depending on the methodology.

'A high mortality ratio is not necessarily a sign of a poor performing trust from a safety perspective... a number of factors can affect an individual figure'

When looking at quality of care, indicators like readmissions within 30 days and length of stay might be considered useful. It is possible that a higher than expected level of readmissions within 30 days in a given specialty (such as orthopaedics) indicates that operations are not being carried out as successfully as they are elsewhere. Likewise, a longer than expected length of stay on a specific ward might indicate problems with the quality of care provided – perhaps a few patients developed pressure ulcers.

However, non-executives should be aware that a longer than expected length of stay can also be a result of poor coding of co-morbidities. This means hospital data will not record how sick the patient is. Alternatively, it could signal a pathway issue where a consultant might be making a judgement based on years of practice such as: "I always keep my patients in overnight". Since indicators can be skewed in this way, it is always in the board's interest to seek assurance from divisional teams where there is an outlier and, if appropriate, instigate consultant-level investigation.

Mortality indicators have taken on a particular importance in the last few years. The three main measures currently used in England are:

- SHMI – Summary Hospital-level Mortality Indicator (Heath & Social Care Information Centre)
- RAMI – Risk Adjusted Mortality Index (CHKS)

'Non-executives should be aware that a longer than expected length of stay can be a result of poor coding of co-morbidities'

- HSMR – Hospital Standardised Mortality Ratio (Dr Foster Intelligence).

SHMI is the only measure now published on NHS Choices.

All three measures are usually expressed as a value of 100. An index above 100 indicates more deaths than expected, whilst a lower index indicates fewer deaths than expected. The Health & Social Care Information Centre publishes SHMI slightly differently. It uses 1.00 as the average, which is often multiplied by 100 to allow comparison.

The NHS Medical Director has made it clear that mortality ratios are one of a number of indicators that should be monitored, and hospital trusts should not rely on a single indicator. In addition, six factors need to be taken into account which can have a direct impact on mortality ratios. These are:

- percentage of the population who die in hospital as opposed to outside
- population demography
- different pathways of care
- zero length of stay emergencies
- palliative care
- data quality.

(For more detail see **www.chks.co.uk**)

'One of the most effective ways to use mortality ratios is to develop a process of review around one measure'

A high mortality ratio is not necessarily a sign of a poor performing trust from a safety perspective. We have seen a number of factors which can affect an individual figure, including the quality of information in the case notes to support accurate clinical coding and the service provision, which is reflective of the local population.

Non-executives therefore need to understand what can impact their own mortality ratio so they can identify areas of sub-optimal care, improvements to their clinical coding processes, or management of patients. Although there is continued discussion about their usefulness as a predictor of the safety of care, it is clear that they are a useful 'smoke alarm' to trigger further investigation. Boards must ensure they have an understanding of what the indicators say about their own organisation and have the necessary processes in place to address any issues highlighted.

One of the most effective ways to use mortality ratios is to develop a process of review around one measure. This will ensure consistency and will allow comparison over time to demonstrate improvement. This review should include triangulation with other indicators such as infection rates and scores from patient surveys.

Activity data, contracting and finance

We have already explained that the NHS contracting rules set down the principles for which payments should be made. Under the standard contract, hospital income is determined by payment by results (PbR), which effectively is a payment by patients; linked to the complexity of the service that has been provided.

This complexity (there are around 26,000 codes to describe specific diagnoses and interventions) is defined by a set of healthcare resource groups (HRGs). These reflect patients who use similar amounts of resource. An HRG code consists of five characters (two letters followed by two numbers and a final letter) and covers a spell of care, from admission to discharge. At present, there

Figure 1.

	Original coding and price	Revised coding and price
Diagnosis	M65.8 – Synovitis and tenosynovitis	M65.8 – Synovitis and tenosynovitis
Diagnosis	F17.1 – Harmful use of tobacco	F17.1 – Harmful use of tobacco
Procedure	W84.6 – Endoscopic excision of synovial plica	W84.6 – Endoscopic excision of synovial plica
Procedure	Z94.3 – Left sided procedure	Z84.6 – Knee site
Procedure		Z94.3 – Left sided procedure
HRG (tariff year 13–14)	HB99Z – Other procedures for non-trauma – £292	HB23C – Intermediate Knee Procedures for non-trauma without CC £1,673

are 1,400 HRGs, which are used as 'units of currency' and support standardised healthcare commissioning across the NHS. One patient spell may involve several different HRGs, so an automated set of rules is applied by centrally provided software (known as a 'grouper' software) to decide the most appropriate one for payment. In essence, this identifies the most costly element of the care provided and assigns the patient spell to that HRG.

NHS tariffs are the set prices paid for each unit of currency (HRG). For example, £118 is the national tariff for an outpatient attendance in obstetrics or £5,080 for a hip operation. There are currently over 1,100 tariffs. So the key to getting the right level of payment lies in the coding. Many of the tariffs have two levels: a lower one for the average/normal patient and a higher one for those with complications. The identification of complications is reliant on coding (and thus on the correct information being recorded in the source document for coding).

An example of the importance of good coding is given in Figure 1, which shows that the inadvertent omission of the site being the knee meant the original coding would have resulted in almost £1,400 less income for the trust.

'A marginal tariff was introduced which meant that acute trusts would be paid only 30 per cent of the NHS tariff price for emergency activity above their 2008/09 levels'

The tariff is multiplied by a nationally determined market forces factor (MFF). This is unique to each provider and reflects the fact that it is more expensive to provide services in some parts of the country than in others.

Non-executive directors should be aware that the PbR tariffs do change and are used as a lever to control spending in the acute sector. For example, best practice tariffs have now been introduced. This reduces the amount paid for a procedure where there is significant unexplained variation between what is considered good practice and practice within the hospital trust. The current list includes cholecystectomy, cataract, fragility hip fracture care and acute stroke care, interventional radiology, primary total hip and knee replacements, adult renal dialysis, transient ischaemic attacks (TIAs), paediatric medicine and day cases in breast surgery, general surgery, gynaecology, orthopaedics and urology.

When a patient is discharged, clinical coders translate the care the patient received into codes using two classification systems. These are ICD-10 for diagnoses and OPCS-4 for interventions (see below). This information, together with other information about the patient, such as age and length of stay, is sent from the hospital's computer system to a national database called the Secondary Uses Service (SUS). Reports from SUS allow commissioners and providers to make adjustments to monthly contract values agreed in the NHS standard contract to reflect what has actually happened to patients.

'Best practice tariffs effectively reduce the amount paid for a procedure where there is significant unexplained variation between what is considered good practice and practice within the hospital trust'

In practice it is not unusual for commissioners and acute trusts to come to an arrangement that is different. Under certain conditions, commissioners are allowed to revert to block contracts (a fixed price for all activity irrespective of volumes).

In the NHS Operating Framework 2010/11 a marginal tariff was introduced which meant that acute trusts would be paid only 30 per cent of the NHS tariff price for emergency activity above their 2008/09 levels. This, together with the non-payment for readmissions within 30 days of discharge, has continued to the current day. The money withheld from providers in payments for non-elective admissions above the threshold is administered by NHS England's local area teams, who use it for "local investment in relevant demand management schemes".

'Benchmarking between trusts can be useful, but too much emphasis should not be placed where rates are higher or lower that the peer group trust'

One further change is that the calculation of the tariff is changing and will no longer be based on officially calculated costs (reference costs) but on a less rigid set of information, which will be collected by Monitor (from trusts who calculate costs at a patient level).

The Department of Health published its last Code of Conduct for Payment by Results for 2013/14 in February this year. It is now up to NHS England to decide whether further additions to the code are needed.

ICD-10 and OPCS-4

ICD-10 refers to the tenth revision of the International Statistical Classification of Diseases and Related Health Problems (ICD). This is a medical classification list by the World Health Organization (WHO). It codes for diseases, signs and symptoms, abnormal findings, complaints, social circumstances, and external causes of injury or diseases.

The code set allows more than 14,400 different codes and permits the tracking of many new diagnoses. This can be expanded to over 16,000 codes by using further optional sub-classifications.

The Office of Population Censuses and Surveys Classification of Interventions and Procedures (OPCS-4) is a procedural classification for the coding of operations, procedures and interventions performed during inpatient stays, day case surgery and some outpatient attendances. Although the code structure is different, as a code set OPCS-4 is comparable to the American Medical Association's Current Procedural Terminology.

Complications and misadventures

Complications and misadventures are recorded by the clinical coding team using the relevant ICD-10 code for the type of complication. This is taken from the information documented in the casenotes by the clinical team. Benchmarking between trusts can be useful, but too much emphasis should not be placed where rates are higher or lower than the peer group trust.

A high rate could simply be down to a trust having more robust information capture and is not necessarily an indication of poor clinical care. In the same way a trust with a lower rate may not be capturing and recording information very well and the lower rate may disguise a poor performing trust. Trusts should ensure there is a procedure in place for monitoring complications and misadventure cases as part of their clinical governance process.

The non-executive directors' guide to hospital data

The non-executive directors' guide to hospital data is a series of Briefings developed by the NHS Confederation and CHKS. The series is intended to increase the non-executive director's understanding of NHS data and give them the confidence to ask the right questions about it.

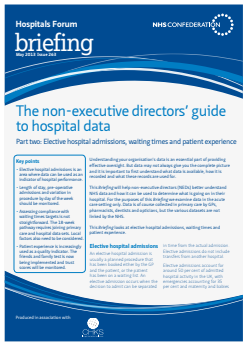
All the *Briefings* are available from the NHS Confederation and CHKS websites.

Part one: Activity, pathways and datasets

This *Briefing* introduces the scale of NHS activity, the range of activity, the patient pathway and the major datasets.

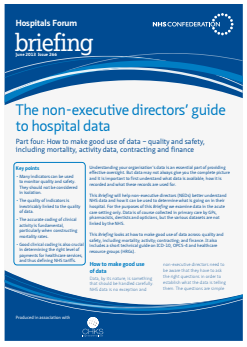
Part two: Elective hospital admissions, waiting times and patient experience

This *Briefing* looks at elective hospital admissions, waiting times and patient experience.



Part three: A&E, non-elective admissions, readmissions and diagnostics

This *Briefing* looks at accident and emergency, non-elective admissions, readmissions and diagnostics.



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The Hospitals Forum

The Hospitals Forum aims to identify the most important issues for hospital service providers, and then work to influence national policy and support and inform members on those priorities.

For more information on our work, see **www.nhsconfed.org/hospitals** or email **membership@nhsconfed.org**

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