EXECUTIVE SUMMARY
REPORT TO THE BOARD OF DIRECTORS’ MEETING
HELD ON 22nd February 2012

Subject | Mortality – Overview and action planning
Supporting TEG Member | Professor Mike Richmond, Medical Director
Lead Author | Sandi Carman, Head of Patient and Healthcare Governance
Status | Note

PURPOSE OF THE REPORT

To update the Board of Directors on the key aspects of Mortality measurement, outline the current position and future improvement plans.

KEY POINTS

Mortality rates in a hospital can be seen as a high level indicator of quality, but must be used with caution and only alongside other indicators of quality, such as, patient experiences, readmission rates and length of stay.

There are a number of ways of measuring and understanding mortality ratios. The two main ones used by the trust are Hospital Standardised Mortality Ratio (HSMR) and Standardised Hospital Mortality Indicator (SHMI).

A combination of internal and external reporting and monitoring systems enables appropriate oversight and scrutiny of the Trusts mortality information.

Measuring mortality alone will not reduce it. Mortality is a hard endpoint and groups deaths together into a single finite outcome measure.

Within the mortality rate there will be an element of avoidable deaths. Beneath this there will a series of avoidable harm events, and errors in treatment that lead to harm. It is only by working on these aspects of care that poor outcomes can be avoided.

The NHS QUEST mortality work stream will be launched in Birmingham on the 6th March 2012, the Trust will be developing a comprehensive action plan to progress the projects identified. It is recognised that following this work further in-depth analysis and review will be required, to include the many process and outcome measures that sit below a high level indicator such as mortality (as listed in section 4).

| Achieve Clinical Excellence | Yes – Improving outcomes |
| Be Patient Focused | Yes – Reducing harm |
| Engaged Staff | Yes – Involvement in improvement work |

RECOMMENDATIONS

The Board of Directors are asked to note the contents of this report.

APPROVAL PROCESS

<table>
<thead>
<tr>
<th>Meeting</th>
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<th>Approved</th>
<th>Date</th>
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Mortality – Overview and action plans

1. Introduction

Mortality rates in a hospital can be seen as a high level indicator of quality, but must be used with caution and only alongside other indicators of quality, such as, patient experiences, readmission rates and length of stay.

Mortality information can be a powerful tool, both to inform patients about the quality of care provided by different organisations, and to enable clinicians to drive improvements in quality within their Directorate.

However if used inappropriately, this information has the potential to mislead patients and the public, and erode confidence in the organisation. It is clear that mortality rates generate, and will continue to generate, significant public interest and professional debate.

Using mortality rates to assess the quality of healthcare is complex especially as Sheffield Teaching Hospitals provide a wide range of services for a wide range of conditions, to patients with very different risks of dying. Calculating the mortality ratio involves a number of calculations to produce the ‘relative risk’ score as explained below.

2. Measurement

There are a number of ways of measuring and understanding mortality ratios. The two main ones used by the trust are:

2.1 Hospital Standardised Mortality Ratio (HSMR)

Standardised Mortality Ratio (SMR) is the ratio of observed deaths to expected deaths multiplied by a hundred.

HSMR is the summated value of each of the SMR for the 56 commonest causes of death in UK hospitals, which covers approximately 83% of all UK deaths.

HSMR calculations are made by a clear and transparent process described by Dr Foster and available at http://www.drfosterhealth.co.uk/hospital-guide/methodology.

Essentially the steps are as follows:

**Mortality Data Collected**

Cleaned (for demographic factors etc)

↓

56 Diagnoses containing 83% of hospital deaths

↓

Hospital Spell or Superspell analysis (Patient been in more than one Trust)

↓

SMR Calculated

HSMR Calculated

Since all mortality rates are in decline, yet admissions continue to rise, in the UK each Trusts HSMR is rebased accordingly by reducing the denominator. Therefore, even in the absence of an intervention, almost all HSMR values will usually increase in absolute terms but statistically this may be meaningless (the change depends on the effect on confidence intervals).
The pragmatic view is therefore that small changes in HSMR values due to rebasing should not be used alone to describe changes in quality, as this metric may be insufficiently powerful to describe an actual change in mortality rates.

Whilst HSMR is a key quality indicator its also crucial to put the value in the context of other quality indicators, and build a picture using different metrics, as well including the individual measures of SMR for the different diagnoses (such as Stroke or Fractured Neck of Femur).

2.2 Standardised Hospital Mortality Indicator (SHMI)

SHMI is the summated value of the SMR’s of all deaths from all causes within hospital and up to 30 days from discharge from hospital.

Developed by the NHS Information Centre with an industry-wide panel of experts the SHMI methodology is similar to the Dr Foster Hospital Standardised Mortality Ratio (HSMR) but with 3 key differences;

1. The SHMI measures in-hospital deaths and deaths outside of hospital for a period of up to 30 days where HSMR measures in-hospital deaths only.
2. The SHMI uses 100% of diagnosis groups whereas HSMR uses only 80%.
3. The SHM does not take into account Palliative Care whereas the HSMR does.

SHMI was also designed to be an industry-wide agreed way of measuring hospital mortality that the DoH will own and publish quarterly on NHS Choices. It will be the standard indicator for reporting hospital mortality across the NHS (http://www.ic.nhs.uk/services/SHMI).

The SHMI is a ratio of the observed deaths in a trust over a period of time divided by the expected number given the characteristics of patients treated by that trust. The value produced is evaluated as to whether the mortality within the trust can be described as either ‘as expected’, ‘lower than expected’ or ‘higher than expected’.

Unfortunately there is no correlation between HSMR and SHMI ratios as the following snapshot data demonstrates.

<table>
<thead>
<tr>
<th>Hospital</th>
<th>HSMR Median</th>
<th>SHMI (Rolling 12 months)</th>
<th>Unadjusted Mortality Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheffield Teaching Hospital NHS Foundation Trust</td>
<td>81.1</td>
<td>86</td>
<td>1.6</td>
</tr>
<tr>
<td>Aintree University Hospital NHS Foundation Trust</td>
<td>77.3</td>
<td>111</td>
<td>1.7</td>
</tr>
<tr>
<td>Homerton University Hospital NHS Foundation Trust</td>
<td>103.4</td>
<td>95</td>
<td>1.1</td>
</tr>
<tr>
<td>Salford Royal NHS Foundation Trust</td>
<td>71.5</td>
<td>95</td>
<td>1.3</td>
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Data source: NHS QUEST Strategic Dashboard (2010/11 data)

Early indication would show that the majority of differences are due to Palliative Care coding however many organisations are still carrying out further analysis.
3. Reporting and Monitoring

A combination of internal and external reporting and monitoring systems enables appropriate oversight and scrutiny of the Trusts mortality information.

**Internal reporting and monitoring**

<table>
<thead>
<tr>
<th>Board of Directors</th>
<th>From the Healthcare Governance Committee - Receive high level HSMR and SHMI reports with notification of areas of concern, along with plans to address</th>
<th>Quarterly</th>
</tr>
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<tbody>
<tr>
<td>Healthcare Governance Committee</td>
<td>Receive and review high level HSMR and SHMI reports with notification of areas of concern along with plans to address</td>
<td>Quarterly</td>
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<tr>
<td>Clinical Effectiveness Committee (CEC)</td>
<td>Review and scrutiny of Dr Foster individual mortality alerts data (for all clinical areas) and monitor progress on the actions to address any concerns.</td>
<td>Six times a year</td>
</tr>
<tr>
<td>Clinical Effectiveness Unit</td>
<td>Monitoring of mortality data and individual alerts. Systematic approach in place to monitor Dr Foster mortality data. Areas of concern are raised immediately with Associate Medical Director (Patient Safety) and reported to the CEC. All alerts are fully investigated and reported and are usually due to coding or case mix issues.</td>
<td>At least Monthly (data is uploaded by Dr Foster monthly)</td>
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**External reporting and monitoring activity**

| Dr Foster | Dr Foster is the UK's leading provider of comparative information on health and social care services. Through the utilisation of different software the Trust can interrogate this information. Conversely when areas of concern are identified Dr Foster alert the Trust and where appropriate the Care Quality Commission of any concerns (memorandum of understanding in place). |
| **Care Quality Commission (CQC)** | CQC has been given explicit powers to follow up concerns and referrals. The mortality outliers programme looks at patterns of death rates within NHS Trusts.  

Using statistical data CQC can identify where, within an organisation, the number of patients who have died after being admitted to hospital for a particular condition or procedure is significantly higher than we would expect.  

Mortality outliers are then usually addressed by writing to Trusts with an ‘alert letter’ or in some cases concerns may result in a responsive inspection visit. |
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<tbody>
<tr>
<td><strong>Strategic Health Authority (SHA)</strong></td>
<td>The SHA uses Dr Foster to monitor activity and mortality across the region.</td>
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| **Medical Examiner** | The majority of hospital deaths are reviewed by the Medical Examiner on behalf of the Coroner.  

In the future this will encompass 100% of deaths and the Trust is currently reviewing the most appropriate way of utilising this information.  

Nationally this work is led by the Death Certification National Steering Group. Representatives on this group include Chris Dorries – HM Coroner Sheffield (on behalf of the Coroners’ Society) and Dr Alan Fletcher – Medical Examiner and Sheffield Teaching Hospitals.  

The new system of death certification in England and Wales aims to:  
- Improve the quality and accuracy of death certification;  
- Introduce a single system of effective medical scrutiny applicable to all deaths not subject to coronial investigation;  
- Increase transparency for bereaved families and  
- Provide improved information on cause of death, to strengthen local governance and public health surveillance. |

http://www.cqc.org.uk/node/111  

http://transparency.dh.gov.uk/category/deathcertification/
Coroners are independent judicial officers appointed and paid for by the local authority who are responsible for investigating violent, unnatural deaths or sudden deaths of unknown cause and deaths in custody that are reported to them.

Chris Dorries (HM Coroner Sheffield) is currently undertaking a review of the inquests from Sheffield Teaching Hospitals.

Conversations with Chris Dorries have indicated that he feels all the inquests have been appropriately opened, and is currently not suggesting the Trust has a problem. The Coroner notes that the numbers of inquests appear to have increased across the board, ie not just hospital cases.

The outcomes of this work will be reported back to the Healthcare Governance Committee as part of the Inquest report.

4. Mortality and Harm Free Care

Measuring mortality alone will not reduce it. Mortality is a hard endpoint and groups deaths together into a single finite outcome measure.

Within the mortality rate there will be an element of avoidable deaths. Beneath this there will a series of avoidable harm events, and errors in treatment that lead to harm. It is only by working on these aspects of care that poor outcomes can be avoided.

Ultimately this requires monitoring of process measures (correct treatment, correct policy or procedure etc) and by doing this we can begin to correct them. This will also lead to a reduction in other outcome measures, such as infection rates and surgical errors. This in turn will hopefully lead to a reduction in the ultimate outcome measure of death.

It is equally important to note that we may be very successful in reducing death rate, but we may still harm as many patients or even more. Hence the Trust requires mechanisms to measure multiple indices of error, harm and monitoring interventions, which affect mortality.

There are four key harm events that can impact on patient mortality:

- Inappropriate management of the deteriorating patient
- Peri-operative surgical error (surgical checklist)
- Medication errors (diabetic medications, anticoagulants, sedatives and opiates)
- Intensive Care Unit (ICU) infections (ventilator associated pneumonias and central venous catheter related infections).

Other areas include falls, length of stay, pressure ulcers, hospital acquired infections such as pneumonia and ineffective treatment of sepsis.

It is only by paying attention to and measuring these outcome measures and the process of correcting them (treatment compliance) that we will impact on mortality ratios. The Patient Safety First and NHS QUEST work streams focus on these elements.
5. Learning with others

Key Trust staff have built up a network of contacts in other organisations to enable the sharing of good practice and provide a simple way of benchmarking.

More recently this approach has been formalised by joining NHS QUEST, which aims to provide a vehicle for Foundation Trusts to aspire to a level of excellence in quality and safety beyond all current expectations. It is a model of working that is focusing on networking among like-minded organisations across England, QUEST members are detailed in Appendix A.

Founded in 2011 QUEST members employ 60,000 people, serve a population of 3.9 million and are recipients of £3 billion of NHS funds.

NHS QUEST are now launching their third improvement workstream – Reducing Hospital Mortality. The programme aims to deliver reductions in in-patient mortality by reconfiguring frontline urgent care, reducing harm, improving end of life care and introducing clinically led coding.

There will be four projects:
1. Moving to a 24/7/365 service
2. Reviewing systems for measurement
3. Reducing harm and deterioration
4. Excellence in End of Life care

Each of these headline projects will have a combination of smaller supporting projects. Named leads have been identified for each of the four projects. Throughout this work we will aim to build on the existing improvement work undertaken within the Trust for example Hospital@Night and Deteriorating patient projects.

6. Next steps

There are a number of systems and processes already in place to measure mortality and harm rates, this new piece of work will provide a timely opportunity for review of the existing mechanism and to ensure the Trust is applying best practice principles.

The NHS QUEST mortality work stream will be launched in Birmingham on the 6th March 2012, the Trust will be developing a comprehensive action plan to progress the projects identified. It is recognised that following this work further in-depth analysis and review will be required, to include the many process and outcome measures that sit below a high level indicator such as mortality (as listed in section 4 above).

Senior Project Directors on this work stream are Dr Des Breen, Associate Medical Director, Patient Safety and Healthcare Governance and Sandi Carman, Head of Patient and Healthcare Governance.

The NHS QUEST work will support the review of all aspects of the Trusts mortality management activity and therefore provide greater assurance regarding the appropriateness of the Trusts current systems and processes.

Report contributors:
Janet Brain, Senior Manager, Clinical Effectiveness Unit
Dr Des Breen, Associate Medical Director
Dr Andrew Gibson, Deputy Medical Director
Appendix A

NHS QUEST members:

1. Aintree University Hospitals NHS Foundation Trust
2. County Durham & Darlington NHS Foundation Trust
3. Doncaster & Bassetlaw Hospitals NHS Foundation Trust
4. Homerton University Hospital NHS Foundation Trust
5. Royal Devon & Exeter NHS Foundation Trust
6. Royal Surrey County Hospital NHS Foundation Trust
7. Salford Royal Hospital NHS Foundation Trust
8. Sheffield Teaching Hospitals NHS Foundation Trust
9. South Tees Hospitals NHS Foundation Trust
10. Southend University Hospital NHS Foundation Trust
11. The Rotherham NHS Foundation Trust
12. The Royal Bournemouth and Christchurch NHS Foundation Trust
13. Wrightington, Wigan & Leigh NHS Foundation Trust
14. York Teaching Hospital NHS Foundation Trust