Using mortality data to improve the quality and safety of patient care

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Contents

Publication notes ............................................................................................................. 1
Introduction ....................................................................................................................... 2
Quality and Safety ............................................................................................................. 2
Why are we monitoring these figures? ............................................................................. 2
Crude Mortality ............................................................................................................... 2
Common Medical Emergencies ....................................................................................... 2
Risk Adjusted Mortality Indices ...................................................................................... 3
Clinical Coding ............................................................................................................... 4
What does this data tell us? ............................................................................................ 5
Health Board wide ........................................................................................................... 5
Emergency Department Mortality .................................................................................... 9
Mortality by District General Hospital (DGH) ............................................................... 10
Ysbyty Gwynedd .............................................................................................................. 10
Ysbyty Glan Clwyd ........................................................................................................... 13
Wrexham Maelor Hospital .............................................................................................. 15
Other Mortality Indicators ............................................................................................. 17
Publication notes

This document is the Health Board’s 10th release of data relating to mortality.

As in previous publications, the Health Board is publishing other contextual mortality data sourced from the Office for National Statistics (ONS). This provides context to the risk adjusted figures, and further evidence of the quality of care provided. As this data is published less frequently, it is now presented as a separate document. This information is also available with that from other Welsh Health Boards from the My Local Health Service Website1.

All data that appear in the document are also available as Excel tables and charts on our website2.

Data has been sourced from the All Wales Benchmarking system and ONS.

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1 http://mylocalhealthservice.wales.gov.uk/
2 http://www.wales.nhs.uk/sitesplus/861/page/68460
Introduction

Quality and Safety
Betsi Cadwaladr University Health Board is committed to delivering safe and high quality healthcare services. Everyone who works for the Health Board has a part to play in driving up standards. We must always put the safety of our patients at the heart of everything we do. To support this, the Board is engaged in a wide range of activities to ensure patient safety, and provide patients with appropriate assurance about the quality and safety of our services.

A key element of this continual cycle of quality improvement is the analysis and understanding of mortality information. This, our 10th publication, contains updated figures for measures up to December 2014. For measures that do not rely on the clinical coding, data is up to April 2015.

Why are we monitoring these figures?
The Health Board monitors mortality on a regular basis, with any concerns investigated. The focus is on continuous quality improvement and timely intervention to ensure the best outcome for our patients.

Focussed on learning we firmly believe that every death deserves a review and have put extensive processes in place to ensure this happens.

What are we measuring?

Crude Mortality
A crude (or unadjusted) mortality rate takes no account of risk factors. The definition is therefore relatively simple (actual deaths in a month ÷ total discharges per month x 100). This figure, stated as a rate per 100 discharges naturally varies by the population served, as well as the mix of specialties provided – for example, Ysbyty Glan Clwyd has a Cancer Treatment Centre.

Common Medical Emergencies
Stroke, heart attack and hip fracture are common medical emergencies associated with mortality. Monitoring mortality for these conditions provides us with further useful information on the quality of care in our hospitals. All three conditions are more prevalent in older people whose health may be more fragile so death cannot always be avoided.
Risk Adjusted Mortality Indices

The risk adjusted mortality figures quoted in this document are for the Health Board’s 3 main district general hospitals (Ysbyty Gwynedd in Bangor, Ysbyty Glan Clwyd in Bodelwyddan and Wrexham Maelor Hospital).

In this release we are publishing:

- RAMI 2014 model, and RAMI 2013 for context;
- the Welsh RAMI 2014, which is based on major Welsh acute sites.
- the In-Hospital Summary Hospital Mortality Indicator 2013 (SHMI).

Risk adjusted mortality indices are one of a number of measures indicating how a hospital is managing the care of its patients and should be considered alongside other measures, such as those published in this document. The indices reflect not only the quality of care, but also the system of care delivery and the quality of information.

RAMI is an important source of data which can help to highlight where further investigation is required. When we read RAMI reports, especially when we compare RAMI scores between organisations, we need to ask ourselves: Are we (really) different? Do we know why? What are we doing about the difference? Are we improving against ourselves? Are we improving relative to everyone else?

Furthermore, RAMI should be used in conjunction with other measures of quality including: patient experiences and feedback; safety measures; healthcare associated infections data. This allows you to attain a wider picture of how the organisation is performing and whether patient care is being compromised in any particular area.

According to the Faculty of Public Health, RAMI should not be used:

- To compare the quality of one hospital to another e.g. league tables

3 Cwm Taff University Health Board. Understanding and interpreting mortality data. N.D. Available at: http://www.cwmtafuhb.wales.nhs.uk/opendoc/223642 (last accessed 27/11/14)

To attribute ‘preventable deaths’ to individual hospitals

To falsely assume that a low or ‘within expected limits’ mortality ratio implies good quality of care and overlook clinical or organisational failings that are causing harm to patients

To only focus attention on hospitals when attempting to interpret hospital mortality statistics, instead of also considering the impact of external factors such as community pressure or hospice facilities

To assume that there are such things as ‘good’ hospitals and ‘bad’ hospitals. In reality, most hospitals are large complex organisations with both good and bad elements across different departments and sites.

A detailed technical explanation of risk adjusted mortality indices can be found on the statistics page of our internet site. This has been provided by CHKS, the provider of the Welsh Benchmarking system. Public Health Wales has also provided a guide to interpreting hospital mortality measures in the context of North Wales, which is also available on the statistics page.

**Clinical Coding**

Clinical Coding is the process of transcribing a patient’s diagnosis and treatment from their case notes onto the Patient Administration System. The quality and timeliness of this data is essential to support reporting. Condition specific indicators reported in this document, such as stroke, heart attack, hip fracture, and the risk adjusted mortality indicators, rely on the clinical coding to define the condition and treatment.

The national target is 95% completeness for any given month within 3 months of episode end date, and 98% for any rolling 12 months within 3 months of episode end date. While the Health Board has achieved the targets for Wrexham and Bangor, further work is required at Glan Clwyd. It is anticipated that this will be rectified prior to the next publication.

It should be noted that this administrative problem does not effect crude mortality data.

The administrative processes surrounding the recording of palliative and end of life care pathways can affect the Risk Adjusted Mortality Index (RAMI). Patients whose admission includes the palliative care code are considered ‘very likely’ to die and so these patients can have a profound effect on hospital mortality measures. RAMI excludes patients receiving palliative care. It is, therefore, important that palliative care is coded as such to ensure that RAMI is not artificially inflated. Since 2013, this also applies to the end of life care pathway coding.

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6 Palmer S. 2014. *A Report to the Welsh Government Minister for Health and Social Services to provide an independent review of the risk adjusted mortality data for Welsh hospitals, considering to what extent these measures provide valid information…* Available at: http://wales.gov.uk/topics/health/publications/health/reports/mortality-data/?lang=en
The following two charts show the percentage of hospital deaths that have been clinically coded with the palliative care or end of life care pathway codes (for the rolling 12 months to June 2014). The 3 Betsi Cadwaladr University Health Board acute hospitals are highlighted in red.

What does this data tell us?

Health Board wide

For the 12 months to April 2015, the average number of deaths per month was 302 across the Health Board. The crude mortality rate for the 12 months to April 2015 was 1.92% (1 in 52 patients), which is marginally better than the all Wales peer at 1.93% (1 in 51 patients).

For the 12 months to December 2014, the Health Board had a Risk Adjusted Mortality Index (RAMI 2014 model) of 118, against an all Wales peer of 113.
Mortality following Surgery

The following two indicators present information on mortality within 30 days of elective (planned) or non-elective (emergency) surgery.

In both elective and non-elective surgery, the mortality rate within 30 days is very low. The 12 months to December 2014 shows a mortality rate of 0.026% for elective surgery (1 in 3815 patients), which was better than the Welsh average. For non-elective (emergency) surgery the rate was 1.7% (1 in 60 patients) for non-elective, which was worse than the Welsh average for the first time.

Figure 4: BCUHB RAMI

Figure 5: Elective Surgery Mortality
Common medical emergencies

The following indicators present information on mortality following specific medical emergencies (stroke, hip fracture, and heart attack). This provides some information on the quality of care in each hospital. All three conditions are more prevalent in older people whose health may be more fragile so death cannot always be avoided. The charts show this data as a rolling 12 months for periods from June 2011 through December 2014).

Stroke

The following chart shows the rolling 12 month mortality within 30 days of an admission following a stroke (June 2011 to December 2014). The latest data shows that 17% (1 in 6) patients died within 30 days of being admitted with a stroke, which is worse than the Welsh average at 15.6% (1 in 6 patients). Coding issues may be contributing but cannot be assumed; extensive work is in progress to understand the reasons for the observed rise, and with this to focus improvements.
Hip Fracture
The following chart shows the rolling 12 months mortality within 30 days of admission following a hip fracture (for those aged 65 and over). The latest data (12 months to December 2014) shows that 5.7% of patients died (1 in 18 patients), which is consistent with the Welsh average at 5.6% (1 in 18 patients).

Heart Attack
The following chart shows the rolling 12 month mortality within 30 days of admission with a heart attack for patients aged 35 to 74. The latest data (12 months to December 2014) shows that 3.0% of patients died (1 in 33), which is better than the Welsh average of 3.5% (1 in 29 patients).
Emergency Department Mortality

The following chart shows the number of deaths per 10,000 attendances for each major Emergency Department (A&E). Data is for a rolling 12 months to April 2015. The 3 major departments in North Wales are highlighted in red. The Welsh average is 21.1 deaths per 10,000 attendances.

The latest data shows the highest mortality rates at Ysbyty Glan Clwyd, whilst the lowest are at Bronglais and Ysbyty Gwynedd. However, due to differences in the configuration of services and patient intake across hospitals, comparisons are not advised. Rather the data should be used to identify trends across time for each site and variations from the norm.

With the data highlighting the Emergency Department at Glan Clwyd as an outlier, this has been subjected to thorough investigation. The following conclusions were drawn:

- The need to appreciate the figure reported is a number, and unrelated to any denominator, not a mortality rate. As such, the figures stated do not take account of individual patient risk of death, as would apply if this were stated as RAMI.
- The fact deaths are recorded as occurring in the Emergency Department (ED), does not necessarily imply the death is within the control of that department. One fact which supports this is the finding that 40% of the deaths were patients arriving in ED in cardiac arrest.
- A significant observation is the high percentage of patients, seriously ill who stayed longer than 4 hours. Four hour performance has proven a challenge, and while we have not found evidence care has suffered as a consequence, it is a fact hospitals with better performance would have counted those deaths within the body of the hospital rather than attributing them to ED.
- This work points to, and has set in train, further multi-agency work with colleagues in Welsh Ambulance, Primary and Community Care, the Nursing & Residential Home sector and the Out of Hours services. This in particular relates to care of patients at the end of their life.
Mortality by District General Hospital (DGH)

BCUHB provides major DGH services at three hospitals, Ysbyty Gwynedd, Glan Clwyd and Wrexham Maelor. The following sections detail mortality data for each hospital.

Ysbyty Gwynedd

For the 12 months to April 2015, the average number of deaths per month was 70 in Ysbyty Gwynedd. The following chart shows the rolling 12 monthly and individual monthly crude mortality figures between June 2011 and April 2015. The crude mortality for April 2015 was 1.6%, and the rolling 12 months was 1.5%.
Based on the 2014 model Ysbyty Gwynedd had a Risk Adjusted Mortality Index (RAMI) value of 108 (for the rolling 12 months to December 2014), which is greater than the average of 100. Data for the previous 2013 and 2012 models is shown for background.

The following chart shows the Welsh Risk Adjusted Mortality Index. This index is based only on the 18 major Welsh hospitals. Ysbyty Gwynedd performed better than the Welsh average of 100, with an index value of 91, based on the re-based 2014 model. Data for the 2013 model is also shown for background.
Ysbyty Gwynedd also had a lower than expected Summary Hospital level Mortality Indicator (SHMI) (Figure 11), with an index value of 66 compared to the expected index value of 82.
**Ysbyty Glan Clwyd**

For the 12 months to April 2015, the average number of deaths per month was 86 in Ysbyty Glan Clwyd. Figure 13 shows the monthly and rolling 12 monthly crude mortality figures between June 2011 and April 2015. The crude mortality for April 2015 was 1.5%, and the rolling 12 months was 1.6%.

![Figure 15: Ysbyty Glan Clwyd Crude Mortality](image)

Ysbyty Glan Clwyd had a Risk Adjusted Mortality Index (RAMI) value of 104 (rolling 12 months to December 2014) compared to the average of 100 based on the 2014 model.

![Figure 16: Ysbyty Glan Clwyd RAMI](image)
The following figure shows the Welsh RAMI. Ysbyty Glan Clwyd had an index value of 88 compared to the Welsh average of 100.

Ysbyty Glan Clwyd also had a lower than expected Summary Hospital Mortality Indicator (SHMI), with an index value of 74 compared to the expected index value of 82.
**Wrexham Maelor Hospital**

For the 12 months to April 2015, the average number of deaths per month was 82 at Wrexham Maelor. Figure 17 shows the monthly and rolling 12 monthly crude mortality figures between June 2011 and April 2015. The crude mortality for April 2015 was 2.2%, and the rolling 12 months was 2.0%.

![Figure 19: Wrexham Maelor Crude Mortality](image)

Wrexham Maelor Hospital has a Risk Adjusted Mortality Index (RAMI) value of 133 (rolling 12 months to December 2014), which is high compared to the average of 100, based on the 2014 model.

![Figure 20: Wrexham Maelor RAMI](image)
Wrexham Maelor Hospital had an index value of 113 for the Welsh RAMI, which is above the Welsh average of 100.

The hospital also had a slightly lower than expected Summary Hospital Mortality Indicator (SHMI), with an index value of 78 compared to the expected index value of 82.
Other Mortality Indicators

Detailed, longer term analysis provided by Public Health Wales of other mortality indicators that are measured in Wales is available on our web site\(^7\).

\(^7\) [http://www.wales.nhs.uk/sitesplus/861/page/68460](http://www.wales.nhs.uk/sitesplus/861/page/68460)