The differences between The CHKS Risk Adjusted Mortality Index (RAMI) and the Summary Hospital-level Mortality Indicator (SHMI)

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A mortality ratio is described as the number of observed deaths divided by the number of predicted deaths. The technical definitions for observed deaths and predicted deaths vary from model to model.

The key points in the structure of SHMI are:

Observed deaths:

- all deaths that occur within an English acute hospital
- plus those that occur within 30 days of discharge from the hospital within England
- counted once - against the last discharging hospital
- no exclusions (such as palliative care)

Predicted deaths:

- all inpatient admissions (only excluding day cases)
- based upon the 259 clinical classification system (CCS) diagnostic groupings (around 140 groups)
- uses a set of logistic regression models
- uses the following variables: age; sex; admission method, and comorbidities

What do these differences between the SHMI and RAMI mean for the overall score?

1. The inclusion of deaths 30 days post discharge (not included in RAMI) will add an average of just over 35 per cent more deaths into the calculation. It is not clear how this will alter an individual trust's relative position on this indicator.

However, it is likely that hospitals where a relatively high proportion of their catchment population die in hospital will see a relatively small increase in the number of additional deaths attributed to them. Conversely those with a lower proportion of their population dying in hospital may find a relatively higher increase. The English average is around 56 per cent of a given population dying in hospital but this varies between local authority boundaries from 44 – 78 per cent.

2. SHMI has no exclusion for palliative care (unlike RAMI which excludes any death coded Z51.5). The impact will vary between organisations depending whether they use this code more or less than the national average. For 2010/11 CHKS saw an average of 14 per cent of deaths being excluded with this code. If a trust has had a higher usage this will increase their SHMI value, if they have had a lower usage it should reduce their SHMI value.

3. The inclusion of zero length of stay emergencies (excluded in RAMI) is going to inflate the overall denominator. This area of activity has seen a large growth in recent years. Again the impact on a trusts SHMI score will depend on whether they have a higher or lower number of this category of patient than average. As they are a low risk group overall the impact may be relatively small.

4. The inclusion of maternal deaths and babies (excluded in RAMI) is unlikely to have a major impact at Trust level as the relative number of deaths is low. It will be more significant once drill-through capabilities are introduced as it is known that there are some variances in coding in this area.

5. The comorbidity variable (three bands of the Charlson co-morbidity index – none, low, high) is a relatively low separation on this variable. RAMI uses the highest risk diagnosis anywhere in the spell and provides greater differentiation. It is not clear yet what the impact of this will be on hospital level scores.

6. SHMI makes no use of procedure, which RAMI uses to help differentiate patients with the same diagnosis. Again the impact of this is difficult to predict.

7. A much larger number of age bands are used in SHMI (every five years is a separate category giving 21 bands) whereas RAMI uses about six bands. This will increase the relative sensitivity to age of SHMI compared with RAMI but it is unclear what the extent of this will sensitivity will be.

Will RAMI be higher or lower on average?

CHKS believes that the SHMI will be higher on average than the RAMI because the SHMI is effectively rebased for 2010/11. If there was no difference between the indicators a RAMI of 91 for 2010/11 (the period that is being published) would appear as a SHMI of 100.

What does this mean in practice?

As with any new indicator it will take time to understand the nuances and sensitivities of the SHMI. The same rules apply to SHMI as for any mortality indicator.

- Being over 100 is not a problem in itself (by definition 50 per cent of trusts will be over 100)
- A value that is outside of statistical confidence limits should be investigated further with examination of other relevant safety and quality indicators to see if there is a consistent problem
- In essence mortality indicators should be treated like a smoke alarm – always checked even if you think you know where the problem might be
- Whilst this indicator (like many) can be affected by the quality of coding it should not be taken as the likely cause unless there are known clear data quality issues.

If you would like further information about the differences between SHMI and RAMI please contact your CHKS consultant or Paul Robinson, probinson@chks.co.uk.