

## Update 1



### An introduction to mortality indicators

#### What is a standardised mortality ratio?

A simple count of deaths alone does not take account of the difference in size of hospitals.

Un-adjusted mortality is a calculation created by dividing the number of deaths by the number of patients treated in a given hospital, for a given period. It produces a percentage rate of patients who die in that hospital. This is perhaps the simplest way to judge hospital mortality performance.

Un-adjusted mortality has a limited place in looking at deaths within hospital. Apart from the obvious differences in size between hospitals it also depends on the seriousness of the conditions that patients are admitted with, commonly referred to as case-mix. This has led to the development of a number of models that adjust for these 'risks' to help understand an organisation's comparative position. Collectively these models produce a statistic known as a hospital standardised mortality ratio (HSMR). The CHKS HSMR is known as "RAMI" (Risk Adjusted Mortality Indicator).

Standardised mortality ratios have been used for a long time in public health, often to examine regional variations in death for specific causes. They produce a figure by comparing the number of actual deaths (often referred to as 'observed deaths') with the number of deaths that the statistical model would predict or expect, having adjusted for the population characteristics (such as age and gender).

Hospital standardised mortality ratios adjust for a wider range of variables which take into account the patients presenting condition, the type of admission (elective/emergency) and any comorbidities (existing disease or disorder).

Following the calculation, a number is produced where 100 is set as the national average. A number higher than this reflects more deaths than might have been expected; a number lower than 100 reflects fewer deaths than might have been expected. Any statistical interpretation also has to bear in mind the concepts of confidence limits and statistical significance. Fundamentally, the question is whether the variation from the average is just by chance or is it a low likelihood that it is from chance.

#### Using a mortality ratio

The Department of Health (DH) has said that:

"A high HSMR is a trigger to ask hard questions. Good hospitals monitor their HSMRs actively and seek to understand where performance may be falling short and action should not stop until the clinical leaders and the Board at the hospital are satisfied that the issues have been effectively dealt with."<sup>1</sup>

CHKS was part of the steering group set up by DH for the national review of the hospital standardised mortality ratio. CHKS has signed up to the above statement and the following further extract:

A summary hospital-level mortality indicator is one of a number of indicators which can provide important information about a hospital and its quality and, in some circumstances, help shine a light on potential areas

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<sup>1</sup> National review of HSMR - consensus statement, Dept of Health, Nov 2010 - [http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/documents/digitalasset/dh\\_121327.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_121327.pdf)

for further analysis or investigation. As a high level measure, it is a helpful indicator to have in the portfolio of screening and surveillance indicators and may help flag potential problems, but only if used in conjunction with and corroborated by other information.

CHKS does not believe that mortality indicators should be used to create league tables as they can be misleading. The most appropriate use is as a monitoring tool within an organisation to evaluate changing performance over time.

### **Rebasing – what is it and why is it done?**

Due to a number of changes that are seen over a period of time, including improvements in clinical practice and clinical coding and changes in population demographics, the average “base” of 100 will change over time. It is therefore good practice to re-base the statistical model of a mortality ratio at regular intervals to re-set the average to 100. This will inevitably change an organisation’s ratio; by how much and in which direction is influenced by a number of factors. The most common change is for the number to go back up to a higher level. Over the last 10-15 years in the NHS the national average has decreased year on year (due to the sort of changes outlined above).

### **The impact of new statistical models**

Occasionally the variables that are used to calculate an HSMR are changed, for example, the way co-morbidities are handled, meaning that the new statistical model produces different results from the previous one. The underlying model for the CHKS RAMI indicator has remained stable for several years.

### **What is happening with the new national indicator (SHMI)?**

The outcome of the DH steering group was to agree to a new indicator to become the national standard for England. It has been called the Summary Hospital-level Mortality Indicator (SHMI).

Originally targeted for release in April 2011, there has been a delay due to the need for some independent statistical modelling work. This work has finished and the steering group met again in May to decide on the main technical characteristics of the recommended model. The final model is currently being completed by the Information Centre. We are awaiting an announcement from the Department of Health about the “go live” date and process. We expect that there will then be a short period of introduction of the indicator to the service before it goes “live” and is published.

At that point any information provider will be able to replicate the model and assist trusts with interpretation. We plan to incorporate the SHMI into our products and programmes as soon as the final model is agreed, defined and released.

In the meantime we will continue to support trusts with the use of RAMI. We will continue to run RAMI alongside SHMI when it is released, to provide consistency for clients used to the model used in RAMI.

### **Find out more**

Should you have any questions, please contact by emailing [information@chks.co.uk](mailto:information@chks.co.uk)

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