MBRRACE-UK
Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK

Explanation of different mortality rates calculated by MBRRACE-UK

The crude mortality rate is simply the number of deaths for every 1,000 births within each organisation. This is a commonly used measure for mortality and is informative, in that it describes exactly what happened for births in a single year. Where there is only a small number of births in an organisation it is difficult in any one year to be sure that any extreme value seen for the crude mortality rate is real and not just a chance finding.

The way that stabilisation works is probably easiest explained by looking at an extreme example. If we take somewhere, such as one of the Scottish Islands, which has around 100 births each year. In this case, their crude mortality rate can only be one of: 0 per 1000 births (i.e. no deaths); 10 per 1000 births (i.e. 1 death); 20 per 1000 births (i.e. 2 deaths); etc. However, it is extremely unlikely that that any of these rates truly reflect the underlying (long-term) mortality at the organisation. A rate of 0 is too low (deaths are not impossible at the organisation) and 10 is too high (no organisation in the UK will have a long-term rate that high).

It is likely, therefore, that the underlying mortality rate for that organisation is actually closer to the average for similar places than it appears to be from the crude rate. Stabilisation moves the estimated mortality rate to something that is closer to the appropriate average. A stabilised mortality rate allows for the effects of chance variation due to small numbers. For this reason, the stabilised mortality rate will tend to be closer to the average mortality rate than will the crude mortality rate, especially for organisations with a small number of births.

An alternative way to look at this is to start from the assumption that the underlying mortality rate is the same for all organisations of the same type (comparator group). We then use the crude rates as evidence that this is not true for each organisation and whether it is likely an organisation actually has an underlying rate different from the average: i.e. do we think that the underlying rate is closer to the average or closer to the observed crude rate?

For large organisations we might be more inclined to believe the crude rate as this is based on a lot of observations. However, for small organisations there is little information to convince us that the extreme value for the crude mortality rate is anything other than a chance finding. This is why the stabilised mortality rate for small organisations always ends up closer to the mean (and further from the crude rate) than do the rates for large organisations.

Furthermore, some organisations have a high proportion of mothers in their local populations who are at particularly high risk of their baby dying before or shortly after birth. There are many reasons why some mothers are at higher risk, including for example being over the age of 40, living in poverty or being pregnant with twins or triplets. These differences in risk between different women mean that even if the care for any particular group of mothers was identical in two organisations, the organisation with the larger proportion of mothers at high risk would have the higher crude mortality rates. To try to overcome this issue, and report a fairer comparison between health providers, we report “stabilised and adjusted” mortality rates as well as the crude rates. This stabilisation and adjustment, as far as is possible, takes into account such differences between populations.