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The perils of the body count

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The perils of the body count

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Central message

It is difficult to count all deaths following interventions but it is not safe to assume that the more you find the worse the care.

The public, our patients, and their families might be surprised to discover that doctors have difficulty in tallying how many people die after cardiac interventions, and that the question merited a piece of published statistical analysis. Maximus and colleagues document how the wider they searched, and the longer after the intervention, the more deaths they were able to find.[1] The attrition continues to 90 days,[2] making it possible to add yet more definitions of operative mortality to their five to take account of that.

A perfect system would capture death following a procedure irrespective of where it occurs, provide correct dates for all deaths, and record in reasonable detail the cause of death. Such a record would ideally allow for attribution of a causal relationship between the death and (a) the quality of the intervention, (b) the underlying disease process and (c) causes unrelated to either.[3] In any analysis of mortality statistics, interpretation must be fair and cogent. Therefore authors steer clear of making comparisons between surgical and percutaneous interventions. It behoves the reader to be similarly cautious. The paper is about retrieving the fact and date of the death, whenever and wherever it occurred. The columns in Figures 2 and 3 are counts of absolute numbers of deaths, not relative death rates.[1]

To emphasise the point, consider the category of percutaneous coronary intervention (PCI) for acute coronary syndrome (ACS). In the early years, coronary surgery was occasionally performed for evolving myocardial infarction with some success, mostly anecdotal. For example opportunistic cases with the patient already in hospital and an available surgical team. But emergency coronary surgery for evolving infarction[4;5] became a serious proposition in the light of remarkable results in 227 patients from a dedicated service in Spokane, Washington from 1972.[6] Later when angioplasty became available it was reserved for elective cases with the safest disease and with a surgeon close at hand. Its application to saving lives and heart muscle in evolving infarction, as close as possible to the onset, whatever the hour, took some time to emerge but it is now the intervention that cardiac surgeons would want for themselves. The context of PCI for ACS requires that some patients will die despite the intervention and others die as a consequence of their disease during the following months. This effect is illustrated in the analysis by Maximus and colleagues.[1;1]

Demonstrating how many more deaths occur with the passage of time after PCI for ACS does raise a question of appropriateness applicable to all complex interventions to varying degrees. These patients may well be approaching the end of their lives due to age, comorbidity, and frailty. In societies which find difficulty in coming to terms with being mortal, interventions such as additional cycles of chemotherapy as well as PCI are clustered in the months before death. Indeed, most health care expenditure on an individual patient is spent in the last year of life. Such interventions may not necessarily shorten lives but are performed near its natural end. Further analysis of societal concerns about the appropriateness of striving for survival at all costs is outside the scope of this commentary but is thoughtfully addressed by the surgeon Atul Gawande. [7]

The body count, to use a brutal term, may be done for several reasons. If we wish to understand the natural course of a disease or the sequelae of an intervention, then short-term hospital mortality is clearly insufficient. Of course the same applies when the body count is a measure of clinical quality, but when we require institutions with scarce resources to chase long-term outcome data for the purposes of treatment quality comparison, we immediately penalise those institutions that comply: more extensive data retrieval will find more deaths. Through the law of unintended consequences, this may actively discourage thorough reporting by others who may be concerned about their position in league tables. For the sake of compliance and simplicity, and until data systems are adequately robust and comprehensive, quality monitoring of cardiac surgery may have to be

pragmatically based on data that are universally available and difficult to falsify, such as death at the base hospital during the same hospital admission as the intervention.

There is an additional statistical quirk in recording deaths. Humans make errors in data entry, transcription and transfer; computers have 'glitches' and 'gremlins'. The record of whether the patient is alive or dead is at some level a yes/no data entry. Provided survivors outnumber deaths, when errors occur a random wrong yes/no entry for death is more likely to falsely record a live patient as dead than the other way round. It follows that incremental improvement in the accuracy of record keeping will tend to lower the recorded death rate. Apparent improvement in clinical outcome may in fact be no more than better record keeping.[8]

### Legend to figure

Parents and families count the deaths outside the 'Bristol Babies' hearing, London 1998.[9]

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Parents are calling for a public inquiry into the deaths

ACCEPTED