Australian hospital statistics: what can they tell us about our health status?

Part 1: a case for hospitals or a hospital case?

Statistics galore

You all knew, of course, that in 2001–02 Australia's public hospitals did 46,568 procedures on the knee, patella, tibia and fibula. And that they had 58,711 admissions for diseases of the eye and adnexa that same year. And that our hospitals provided 19,691 records of care provided for haemorrhoids among males.

These are the kinds of statistics that journalists love to quote in health articles. They're large enough to sound spectacular in their own right. They look like there's a lot of pain going down and medical work going on. Did you know that! Say no more.

But what statistics like these really tell us, apart from their gee-whiz impact, can be quite another matter. We need to put them in context with other information so we can see how they vary and then make comparisons. Is the number of procedures on the knee, patella etc. higher in public hospitals or private ones, for example? Does the rate (e.g. number per thousand of population) of public hospital admissions for eye diseases vary from state to state; and if so is this balanced out by the pattern of admissions to private hospitals in those states? Do females have the same rate of haemorrhoid admissions as men? What were the figures in past years and is it possible to compare Australian statistics with those of other countries? And when we find differences, why might that be?

The scope for questions like these, and their answers, is enormous. And the lead to them can be found in the Institute's two national databases covering hospitals. The National Hospital Morbidity Database contains a vast store of annual data about the health problems that public and private hospitals deal with, the basic features of the patients they admit and the surgical and other procedures they carry out for those patients. The National Public Hospital Establishments Database records the number and size of public hospitals around Australia, the specialised services they offer, the number and type of staff they employ and their expenditure and revenue. The original records are made by hospitals mainly for internal administrative purposes, so when they are adapted to produce state and national databases the result is sometimes known as 'administrative byproduct' data.

Along with some other sources, data from these collections are neatly summarised each year in the Institute's publication *Australian Hospital Statistics*. This valuable report tells us much about our hospitals, what's going on in them and how they may be performing in some key areas. We often modestly summarise what these statistics can tell us as 'hospital use'. But as you can see, this doesn't do them enough justice.

But is there even more?

More than just use, hospital statistics can obviously tell us a lot that relates to health itself, at least to health that is bad enough to warrant a visit to hospital. Researchers have shown how we could use the statistics in building a picture from people's contact with various parts of the health system, including how we might link their hospital experience with later outcomes, even death. This would depend on a technique that is usually not possible at the national level, namely record linkage—being able to link up various health databases that were not originally designed for that purpose.

And there is the question of whether hospital statistics also help as a barometer of Australia's *levels* of health—to whether our overall health is good, bad or indifferent, to whether it is improving or not, to trends in the onset and prevalence of major diseases, and so forth. In short, what can they tell us about our health status?

Statistically speaking, Australia is fortunate enough to have good data about the bad news—namely how many people die of what causes each year. But data are thin on the ground about the rate at which people are actually *getting* diseases and other health problems each year, on the incidence of these things. Our best information on incidence comes from disease registers, such as we have for cancer. But registers are not cheap and there are very few of them in comparison to the vast number of diseases. We don't have a national register for a major killer like heart attack, for example.

If we don't know the rates of onset as well as mortality, we can't so easily sort out, for example, what a high-ish number of deaths each year tells us on its own. Does it just reflect that there are many cases arising, or that there are not so many cases but they are usually serious when they occur, or that the cases are both serious and frequent… and so forth? This makes it harder to gauge whether the challenge is mainly one for prevention, for better treatment, or a mixture.

Obstacles we can't ignore

But when we turn to hospital statistics for help with this kind of question, we run headlong into some big limitations. We shouldn't be surprised or blame anyone for this, of course. The records were not designed for this purpose in the first place.

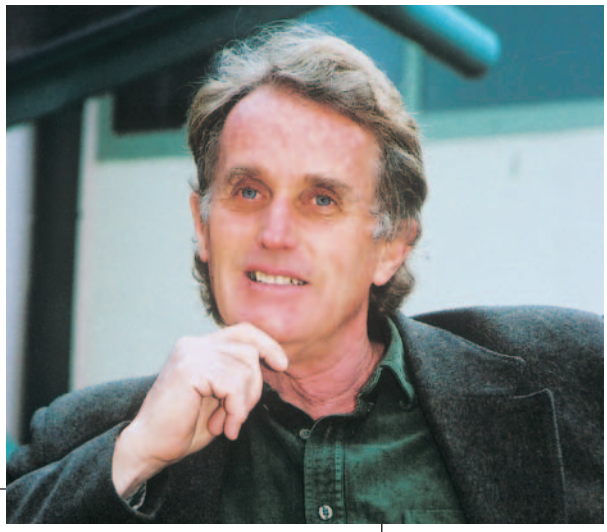
First, there's the question of which health problems would be worth examining. We all know that most people with a problem don't need to go to hospital (thankfully) so the statistics can't cover their cases. Many disorders will almost never need hospital attention while in other cases some will and some won't.

So what if we focused on only more serious disorders that usually involve at least one visit to hospital? Even then there may not be a precisely consistent relationship with hospitalisation. It may vary from place to place and year to year, just enough to complicate our interpretations. Policies and practices can vary. In a particular year some hospitals may be more inclined to admit patients for a problem of a particular type or severity, while others tend to feel it can be well handled outside. Similarly with the attitudes of those who refer patients to hospitals, such as GPs.

This variation between hospitals wouldn't matter for *national* statistics about a disorder, of course, provided we had a very confident handle on the overall proportion of cases that are admitted and this didn't change from year to year. But the next year, practices may change widely after the publication of strong new guidelines for treatment or the results of clinical trials. Or, as medical experience grows, there may be an increasing general willingness to do certain procedures that involve hospitalisation.

For example, take coronary revascularisation procedures—coronary artery bypass grafting (CABG) or angioplasty, both of which aim to overcome a critically blocked blood supply to the heart and restore good blood flow to it.

What if we tried to use revascularisation statistics to get an idea of population rates of heart diseases—heart attacks or angina cases? The Institute has shown that revascularisation rates have been rising for many years, so we might be tempted to conclude that the heart disease rates are increasing apace. In fact there is good evidence that rates of heart attack, at least, are actually *declining*.



Dr Paul Magnus, AIHW Medical Adviser

The discrepancy is probably because doctors are becoming more and more adept at revascularisation procedures and convinced about their benefits, so they are doing them on a growing proportion of people with blocked arteries.

Then there's the challenge of using hospital statistics to measure incidence. This can be defined as the number of new cases of an illness or health event occurring within a specified period. And things can become complex, even assuming we can find suitable health problems to examine in this context.

Say we want to count *people* as new cases and our period of interest is one year, the period covered by *Australian Hospital Statistics*. We need to remember that an individual may have multiple admissions during the 12-month period. For example, some people will have the onset of a chronic problem such as diabetes while others may have one or more of what can be called an acute event, such as a heart attack or a broken leg.

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The diabetes may be diagnosed in hospital early in the 12-month period, involve a second admission to assess and stabilise treatment, and yet a later one if further tests are required down the line. A person who has two heart attacks in the one year will be admitted at least twice and the same fora jockey who breaks his leg twice. If we can't take these situations into account there is the risk of over-counting people.

Similarly, if we want to count 'new' or 'onset' *events* as a measure of incidence, there is risk of over-counting the events. In the example of diabetes above, it can have only one onset despite several admissions. Heart attack is a more complex example. The *attack* itself is a new event and can be treated as such, even though the underlying disorder it represents—coronary heart disease—is regarded as a chronic disease. So if you want to be sure of counting only the 'events' you would want to distinguish (within a series of admissions, say) between admissions for new attacks and admissions for other reasons such as complications, follow-up, or further investigations. You would then count each 'heart attack admission' as a new event.

But when we look at the hospital records to see if we can sort these things out, they certainly don't provide any neat guide to incidence. In the jargon, they are 'separation based' and not patient based. A separation marks the completion of an 'episode of care', which means it occurs whenever there is either a transfer in-hospital to another type of care (say from acute care to rehabilitation), a discharge out of hospital, a transfer to another hospital, or death in hospital.

In other words, Australia's hospitals could have 100 separation records for a particular condition over a year. But you would need extra facts to tell if this reflected 100 different people, 90 who were admitted only once and one who was admitted 10 times, or many other combinations. And even more facts to separate onset events from other reasons for admission. If we cant sort out these issues we will over-count.

We hope in the future sometime to be able to link multiple separations for the one disease experience. This would certainly simplify interpretation and analysis.

Questions to explore (next time)

So in the light of these obstacles, is it realistic to think that hospital statistics might help tell us about our levels of health? I think it is.

In the next issue of *Access* I want to explore the following questions:

- What health problems might be candidates for using hospital statistics to decide their incidence, and why?
- Can we overcome the obstacles posed by separation-based records in our efforts to obtain counts of people with onset events, or of the new events themselves?
- How are hospital statistics used in other ways to shed light on our overall health status?

Postscript: thanks to Jenny Hargreaves for a lot of helpful guidance on this subject.

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