

# Administrative databases: Fact or fiction?

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**B**ryce Taylor's article in this issue (page 481) focuses attention on the use of information from health care administrative databases for public audits or "scorecards" of the quality of patient care.

The background for this article is important because it relates to the vital topic of the public accountability of providers, both institutional and individual, for the quality of medical care. The idea of scorecards for institutions, recently endorsed by the Ontario Hospital Association,<sup>1</sup> is appropriate, but the story behind Taylor's article emphasizes that the development of such scorecards is neither simple nor straightforward.

In 1996 Cohen and colleagues, using information abstracted from hospital discharge records from the Canadian Institute for Health Information (CIHI), examined changes in practice and outcomes for cholecystectomy since the introduction of laparoscopic techniques for that procedure.<sup>2</sup> They identified cases of laparoscopic cholecystectomy by means of procedure codes. Among the outcomes analysed was the incidence of what they described as "bile duct injuries," which were identified by code 998.2 ("accidental puncture or laceration during a procedure") or 576.3 ("perforation of bile duct") of the *International Classification of Diseases*, ninth revision (ICD-9).<sup>3</sup> Cohen and colleagues acknowledged that the severity of injuries was not confirmed, but the average reader would have assumed that these were injuries to the bile ducts.

The same data were more briefly addressed in the 2nd edition of the practice atlas of the Institute for Clinical Evaluative Sciences in Ontario (ICES),<sup>4</sup> and the same codes were used to identify bile duct injuries. The authors of the ICES article reported wide variations in the rates of these injuries from one hospital to another. They speculated that some of the results might have been due to coding practices and that "the true rates may be underestimated." Again, the average reader could be forgiven for believing that all of the complications identified by these codes were actually bile duct injuries. Both this article and the one by Cohen and colleagues<sup>2</sup> were peer reviewed.

Subsequently, a Toronto reporter gained access to the CIHI database under access to information legislation and published an article entitled "The low-scar surgery with a high risk."<sup>5</sup> In that article, 21 hospitals were identified as having high levels of bile duct injuries, and the actual numbers of injuries for each hospital were published. Before publication, the reporter was informed of the potentially misleading nature of the data.

Taylor reviewed the charts of 104 patients (from 18 of the 21 hospitals) identified as having "bile duct injuries" in the newspaper article. Of these injuries, 24 had been classified by the hospitals as "major." Taylor confirmed this assessment, noting that 18 of the injuries might have been associated with serious morbidity. He felt that the other 6 were "unlikely to cause serious or long-term morbidity."

The other 80 charts reviewed by Taylor were chosen at random from the 402 patients identified by the hospitals as having minor or clinically irrelevant injuries. Taylor confirmed that 71 of these injuries consisted of "inadvertent incision or puncture into the gallbladder and leakage of small amounts of bile from the organ during or after its removal from the gallbladder bed" and were thus irrelevant to patient outcome. In 5 other cases, there had been no record of intraoperative bile leakage, but the pathologist had reported finding a hole in the gallbladder. In the remaining 4 cases, Taylor classified the injuries as either "unlikely to cause serious



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or long-term morbidity" (1 case) or "requiring further treatment with no significant long-term effects" (3 cases). Thus, among the 426 cases (from 18 hospitals) that reportedly involved bile duct injuries, there were 18 injuries (4.2%) with possible long-term consequences. Assuming that the sample of 104 cases examined by Taylor was representative, an additional 26 patients (6.1%) had injuries that were "unlikely to cause serious or long-term morbidity" or conditions "with no significant long-term effects." The remaining 89.7% of injuries were irrelevant to patient outcome, most of them injuries to the gallbladder during its removal — a very different matter from an injury to the bile duct.

One can speculate about the appropriateness of the publication of the newspaper article after a warning had been given about the potentially misleading nature of the data. Of more concern, however, are the 2 peer-reviewed articles, published by respected organizations, which were equally misleading. The true nature of the data came to light only when the institutions identified by the reporter conducted direct chart audits. The result of these checks was not a minor discrepancy; rather, Taylor concludes that 95% of the injuries that had been characterized by the hospitals as minor, but which had been discussed in the newspaper article as if they were major, were irrelevant to patient outcome. If the same rationale is applied to the data presented by Cohen and Young,<sup>4</sup> the rate of bile duct injury in Ontario could be as low as 1.2 for every 1000 procedures, rather than 11.6 for every 1000 procedures, as has been reported.<sup>4</sup> The possibility of a 10-fold difference in rate is disconcerting.

Administrative databases have rules for code assignment, but the precise application of these rules is based upon judgement. The coder reading the operating notes and assigning the codes makes a judgment as to whether or not what is described in the notes represents a complication. It is easy to agree that a small tear in the gallbladder during removal could be reasonably coded as "accidental puncture or laceration during a procedure." However, it is a major leap to call that a "bile duct injury."

The ICES data showing variation in rates of injury codes<sup>4</sup> has led to the implication that there may be significant variation in hospital coding. The approach to documentation may simply differ in rigour between hospitals. However, because the coding of complications for an operative procedure has the potential to change the case mix group assignment, the Ontario case weight may in turn be affected. Ontario case weights are used in determining hospital funding under transitional funding formulas. It is possible to speculate that in such a climate there may be some effect on the enthusiasm for coding complications.

The issues surrounding the quality of data were also addressed in an appendix to the second edition of the

ICES practice atlas.<sup>6</sup> The appendix included the statement that "clinical data on secondary diagnosis, comorbidities, and complications are less likely to be recorded accurately and comprehensively in hospital discharge abstracts, and the rates of agreement on case-mix may be accordingly low."

This statement does not mean that all of the information in such databases is of no value for reporting outcomes or producing scorecards on institutional or individual performance. However, it does mean that any data used for such purposes must be validated and indeed must be validated for the specific institution in which they are being used.

Such use and validation will inevitably drive the need for more conformity in abstraction and coding. Conversely, the careless use of such data will produce adverse institutional and individual reaction to efforts at responsible accountability structures based on audits and scorecards.

The lesson to be learned from this tale is that administrative databases contain a lot of facts. In reporting these facts we must truly understand them and not give them fictional descriptors. This means much extra work and much more direct clinical consultation by the epidemiologists and others who use the databases.

In the absence of such an approach, the databases will fall into disrepute. This would be unfortunate, because with careful use administrative databases can make significant contributions to both monitoring and improving the quality of care.

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