Editorial Comment

How Do We Know How Well We Are Doing?*

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It has been 88 years since the summer day in 1910 when Boston surgeon Ernest Amory Codman first proposed that hospitals should publish their mortality rates (1). He reasoned that both physicians and the public needed to know the outcomes of medical and surgical care. His ideas were immediately unpopular in the professional community. Concerns were expressed about differences in the patient case mix, about the effect that public data release would have on physicians’ willingness to tackle difficult cases and about migration of patients in response to data publication. In recent years many of these controversies were rekindled by a number of local or statewide public data releases (2,3). Proponents of such programs say that physicians need comparative data on outcomes to manage and improve clinical care. Some proponents say the public has a right to know the outcomes of clinical care when they choose the person or institution to provide their medical or surgical care. Opponents raise concerns about the validity of methods to adjust for differences in patient case mix, the statistical instability of low rates of adverse outcomes and the chilling effect that these data will have on physician decision making. The only fundamental changes in nearly a century of debate over this issue are the development of multivariate statistics and that these data release programs are now a mandated reality in many areas of the United States.

Perhaps no data release program has undergone more intense scrutiny than the New York State Cardiac Surgery Reporting System. This program has been in place since 1988 and initially focused on the short-term outcomes of coronary artery bypass graft (CABG) surgery. The program has developed methods for multivariate adjustment for patient case mix (4) and has reported hospital and physician outcomes since 1991 (5,6). The program has been criticized for physician “gaming” of the data reports and for inadequacy of its statistical methods (7). However, an article by Jones et al. (8) shows similarity of results of the multivariate methods used by the New York State Program and those used in other locations. Further, validation studies conducted by the New York State Program showed that gaming the data collection system was not a likely cause of the differences in risk-adjusted mortality rates (9). In 1994 the New York State Program reported a substantial reduction in the perioperative mortality associated with CABG surgery and attributed this, at least in part, to the effects of the program (10).

Since then two published articles have used indirect evidence to claim that the improved outcomes of CABG surgery seen in New York were a result of the migration of sicker patients to surrounding states or a result of a temporal trend toward improved outcomes in the United States. Data on consecutive cases of CABG surgery seen at the Cleveland Clinic between 1989 and 1993 were examined by Omoigui et al. (11). Based on 485 patients residing in New York but receiving CABG surgery at Cleveland Clinic, the authors concluded that New York patients were more likely than other patients to have had prior cardiac surgery, to be New York Heart Association functional class III or class IV and have experienced higher mortality rates. The authors concluded that public dissemination of outcome data may have been associated with increased referral of high-risk patients from New York. Examination of hospital discharge data from Massachusetts were used by Ghali et al. (12) to evaluate cardiac surgical mortality at 12 hospitals. These mortality rates improved from 4.7% in 1990 to 3.5% in 1992 and 3.3% in 1994. The authors concluded that since improvement occurred in Massachusetts, which had no statewide outcome reporting program, the improvement reported in New York may have been largely a consequence of a regional decline in cardiac surgery mortality.

In this issue of the Journal of the American College of Cardiology, Peterson et al. (13) present an analysis of the CABG outcomes in New York State. These findings are based on the national Medicare claims data. They studied claims and clinical outcomes on over 700,000 CABG procedures to assess both migration from New York State and average annual improvement in CABG surgery during the period 1987 to 1992. The results do not support either migration or temporal change as the cause of the apparent improvement in CABG mortality in New York State. Peterson et al. found that the overall migration from New York State actually decreased during that period. Further, the comparison with data from other states showed that New York State had the lowest CABG mortality in the United States and was the most improved of the low mortality states during 1987 to 1992.

Why did Peterson et al. reach a different conclusion than did Omoigui et al. and Ghali et al.? Omoigui et al. showed that, compared to patients from other areas and to historical controls, there was an increased severity of CABG patients referred to the Cleveland Clinic from New York during 1988 to 1992. This was almost certainly true but it may have been largely a local effect. Omoigui et al. believed this was evidence of a general migration of CABG patients from New York: it was not. More comprehensive data presented by Peterson et al. actually show a decline in migration from New York during this time period. Ghali et al. showed improvement in CABG...
mortality in Massachusetts between 1990 and 1994. Peterson et al. also showed improvement in CABG mortality rates in Massachusetts at approximately the United States average and improvement in New York at a substantially higher rate. In both of these instances strong inference required a broader view. Neither the Cleveland Clinic data nor the Massachusetts hospital discharge data afforded such a view. Both Omoigui et al. and Ghali et al. were likely correct in a local sense. However, the inference based on these local observations was limited by the scope of their data. The broad scope of the Medicare claims allowed stronger inference on large-scale effects than did the local or statewide databases.

The analyses of Peterson et al. are based on Medicare claims data. Should we believe the Medicare claims data? The advantages of analyses using the Medicare claims are substantial in that they are the only comprehensive national database with which to examine the outcomes of CABG surgery among elderly patients. The claims data track mortality very accurately and also contain highly accurate data on patient age, sex and place of residence. While some information on comorbidity and acuity may be obtained from the claims data, it is not as accurate as the primary data collected in research databases or as prospective data being collected as part of quality improvement efforts (14). For the purpose of studying migration from New York State however, the Medicare database is ideal. For the purpose of comparing mortality rates there is a legitimate concern that these differences in observed mortality are, at least in part, a consequence of confounding by patient or disease characteristics. The risk adjustment model of Peterson et al. included patient, age, sex, race, the presence of acute myocardial infarction and the Charlson comorbidity index. Variables such as the results of cardiac catheterization are not available in the Medicare claims database. When comparing physicians’ individual practices or the results of individual hospitals, more clinical detail would allow greater certainty that the observed outcomes are not distorted by differences in patient case mix. When large population groups are being compared, and after accounting for demographic variables, acuity and comorbidity, residual confounding by patient case mix is a smaller concern but it cannot be entirely eliminated as a cause of the observed differences in CABG mortality rates (15).

How should we react to these differences in adjusted mortality rates and rates of improvement? Peterson et al. observed more than twofold differences in CABG mortality by state and very large differences in the degree of decline in mortality rates. These differences are invisible from “ground level.” No hospital or individual practitioner could observe these differences from their experience. The New York State initiative demonstrates that clinical care can be substantially improved. The demonstration of Peterson et al. of wide variability in CABG mortality rates shows that there is substantial opportunity for improvement. Clinicians must ask why do these mortality rates differ and explore internal and external collaborative efforts to improve. It is no longer acceptable to blame the patients. Different systems of care produce different results. The challenge is to understand the lessons that these different outcomes have to teach.

References