

ating a healthy society. Should the US, as one analyst has suggested,<sup>11</sup> enact a "sin tax" on cholesterol-containing foods — a ctu (cholesterol tariff unit) tax to complement President Clinton's btu tax? Would a compromise between the public health model and the drug treatment approach be accomplished by increasing niacin fortification of refined flour to pharmacologic doses? Clearly, the cholesterol debate has just begun.

Kevin Grumbach, MD  
San Francisco, CA

## References

1. Report of the National Cholesterol Education Program Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. The Expert Panel. *Arch Intern Med* 1988; 148:36-69.
2. Hahn DL. Systematic cholesterol screening during acute care visits. *J Am Board Fam Pract* 1993; 6:529-36.
3. Giles WH, Anda RF, Jones DH, Serdula MK, Merritt RK, DeStefano F. Recent trends in the identification and treatment of high blood cholesterol by physicians. *JAMA* 1993; 269:1133-8.
4. Rosengren A, Wilhelmsen L, Eriksson E, Risberg B, Wedel H. Lipoprotein (a) and coronary heart disease: a prospective case-control study in a general population sample of middle-aged men. *BMJ* 1990; 301:1248-51.
5. Grumbach K. How effective is drug treatment of hypercholesterolemia? A guided tour of the major clinical trials for the primary care physician. *J Am Board Fam Pract* 1991; 4:437-45.
6. Krahn M, Naylor CD, Basinski AS, Detsky AS. Comparison of an aggressive (U.S.) and a less aggressive (Canadian) policy for cholesterol screening and treatment. *Ann Intern Med* 1991; 115:248-55.
7. Muldoon M, Manuck S, Matthews KA. Lowering cholesterol concentrations and mortality: a quantitative review of primary prevention trials. *BMJ* 1990; 301:309-14.
8. Oster G, Epstein AM. Cost-effectiveness of anti-hyperlipidemic therapy in the prevention of coronary heart disease. The case of cholestyramine. *JAMA* 1987; 258:2381-7.
9. Garber AM, Wagner JL. Practice guidelines and cholesterol policy. *Health Aff* 1991; 10(2):52-66.
10. Froom J. The real enemies: obesity, inactivity, and tobacco consumption. *J Am Board Fam Pract* 1991; 4:269-71.
11. Bodenheimer T. A public health approach to cholesterol. Confronting the "TV-auto-supermarket" society. *West J Med* 1991; 154:344-8.

## Cost-Effectiveness Of Care By Family Physicians

In recent years there has been growing interest in learning how to provide the most effective health care for the least amount of money. Hospital expenditures account for approximately 40 percent of the national health care bill. Although the increases in costs can be partially attributed to price inflation and population growth, physicians play a central role in influencing these expenditures as they manage patient care. Physicians are responsible for admitting and discharging patients from the hospital and ordering such hospital services as laboratory tests, radiographs, pharmaceuticals, and nursing and critical care, as well as surgery.<sup>1</sup> Because hospitalization rates have been shown to differ widely among physicians and these differences are related to factors other than the health status of the individual patients,<sup>2</sup> physicians are under increasing pressure to care for their patients with cost-effective utilization of health care resources.

There are important differences in patterns of utilization of health care resources by physicians of different specialties.<sup>3-6</sup> The Medical Outcomes Study (MOS) recently reported that, even after controlling for patient mix, specialists used significantly more resources than generalist physicians.<sup>7</sup> One important finding was that the patients of cardiologists and endocrinologists had considerably higher rates of hospitalization than those of family physicians and internists, with the rates of cardiologists and endocrinologists being significantly different from those in family practice. Whether this increased use of health care resources affects patient outcomes (health status and satisfaction) will be the subject of the final phase of the MOS.

"Outcome and Cost of Family Physicians' Care: Pilot Study of Three Diagnosis-related Groups in Elderly Inpatients" by MacLean<sup>8</sup> in this issue of *JABFP* compares the hospital care

Submitted 8 June 1993.

From the Department of Family Practice, University of California, Davis. Address reprint requests to Klea D. Bertakis, MD, MPH, Department of Family Practice, 2221 Stockton Boulevard, Sacramento, CA 95817.

given by family physicians with that of all other physicians for three diagnosis-related groups (DRGs). This pilot study examined the feasibility of using a large secondary data set — the Pennsylvania MedisGroups data base.

In the MedisGroups quality assurance system, now required for hospitals throughout Pennsylvania, the medical record of every patient admission is abstracted at each hospital. Patients are assigned to admission severity groups 0 through 4, with a score of 4 indicating most serious illness. This designation is based on key clinical findings reflecting association with actual or possible organ failure. The first review is considered the admission review and for adult medical patients encompasses the first 2 calendar days of the hospital stay. The second review covers days 3 through 7 of the hospital stay and is focussed on the morbidity that has occurred up to that point in the hospitalization.

MacLean studies all 1990 hospital admissions for elderly patients having gastrointestinal bleeding (DRG 174), medical back pain (DRG 243), or metabolic disorders (DRG 296). Patients were then stratified into the five MedisGroups admission severity groups (0 through 4) for each DRG. Outcome variables included in-hospital mortality, mean length of stay, and total charges for the hospitalization (as a proxy for actual costs). He did not use the MedisGroups second morbidity review as a patient outcomes measure. For gastrointestinal bleeding, family physicians had significantly lower total charges for patients in admission severity groups 0, 1, and 2 and a shorter length of stay for those in severity group 1, without any difference in mortality. For medical back pain, there was a trend for family physicians to use fewer resources, but this trend was not statistically significant. In fact, the only significant practice differences here were shorter length of stay for the patients of nonfamily practice physicians in admission severity group 0 and higher mortality for patients of family physicians in group 3. Finally, for metabolic disorders, practice variations were mixed; the only significant finding was lower total hospital charges for family practice patients in admission severity group 3.

McGann and Bowman<sup>9</sup> also used the MedisGroups data base to compare outcome measures for patients aged 65 years and older

who were admitted to the hospital by family physicians and internists. Using the 10 most common DRGs for internists, they found that patients admitted by family physicians were significantly older and had higher admission illness severity. Nonetheless, there were no significant differences in morbidity (determined at the second review on hospital day 8) or mortality. Moreover, patients cared for by family physicians had significantly lower average hospital charges.

Unfortunately, both the study by McGann and Bowman and the one by MacLean have suffered from several methodological limitations. Patients were not randomized to care; consequently, both studies might be comparing patient populations that were significantly skewed by self-selection.

Similarly, such patient characteristics as sex, race, and socioeconomic status were unavailable, further limiting the comparability of patient mix for the groups of physicians studied. The MOS provided convincing evidence that patient mix was related to utilization and differed significantly across medical specialties and systems of care.<sup>7,10</sup> Researchers in that study used the term *patient mix* as a comprehensive term for those characteristics that could affect the interpretation of medical specialty and care system differences in resource utilization and patient outcomes. Patient mix included four components: sociodemographic characteristics, disease prevalence, disease-specific severity, and functional status. Indeed, it has been shown elsewhere that, after adjustment for DRG, patients of lower socioeconomic status had significantly longer hospital stays than patients with high socioeconomic status. Total hospital charges were also higher for patients of lower socioeconomic status, although the differences were not statistically significant.<sup>11</sup>

Patient outcomes are recognized as the final validators of the quality of medical care; therefore, the choice of outcomes to be studied must be carefully considered. MacLean used in-hospital mortality as his only patient outcome variable. Death is an important but relatively unusual consequence of most medical care. To evaluate the effectiveness of care for most patients, other outcome measures must be used. Prominent researchers in this area have high-

lighted the value of such patient outcomes as reduction of symptoms, improvement in daily functioning, or improvement in the sense of well-being and health-related quality of life, in addition to conventional biomedical parameters.<sup>12</sup> The development of valid measures of health status has changed the standards for medical research.

Another study weakness was the absence of information linking physicians to the specific hospital in which they practice. A recent clinical assessment of the MedisGroups system<sup>13</sup> pointed out the relatively heavy weight given findings from specialized diagnostic technologies (e.g., cardiac catheterization and endoscopy) in computing severity scores. Thus, patients at tertiary or teaching centers might have artificially higher severity of illness scores than similar patients at hospitals with fewer technological resources. Likewise, because the smaller hospitals have fewer specialized diagnostic services, the costs for patients admitted to these hospitals would be expected to be lower in addition to the differences in charges that normally occur across hospitals. It could be speculated that family physicians admit their patients to smaller, less costly hospitals. Without knowing the size and type of hospital for comparison by physician specialty, the extent to which these factors might affect the results is also unknown.

An important issue in any study using MedisGroups severity scores is the validity of the system. Iezzoni and Moskowitz<sup>13</sup> found that fewer than 1 percent of patients (aged 65 years and older at 24 hospitals) with severity scores of 0 or 1 died in the hospital, compared with mortality rates of 60 percent for those with scores of 4. They also found that, in general, as admission MedisGroups scores increased, so did the mean costs and lengths of hospital stay. These findings would seem to support the validity of MedisGroups as a severity measure. Unfortunately, however, the addition of admission MedisGroups score to DRGs added only a modest increment to the ability of DRGs to predict differences in the costs of hospitalization.<sup>14</sup> Thus, the system is still being studied to determine its utility for health policy research.

It should be noted that the MacLean study does have several strengths not found in previous studies. Because each hospital in Pennsylva-

nia is statutorily required to abstract charts for all admissions using the MedisGroups system, the study sample represents the entire population of hospitals, patients, and physicians in the 11-county region of southcentral Pennsylvania, which circumvents the problem of missing data and is also important because hospital practice might vary between geographic regions. Furthermore, the specialty of the family physicians in the study was confirmed by membership in the Pennsylvania Academy of Family Physicians or diplomate status in the American Board of Family Practice or both. That a portion of the family physicians were included in the group of other physicians serves only to emphasize the differences found between the family physicians and other physicians.

The recent emphasis on physician practice style differences and outcomes research has created a new demand for data providing information regarding the longitudinal follow-up of patients. Health care policy makers and researchers have recognized the potential of existing administrative, clinical, and health survey data bases for this purpose.<sup>15</sup> The Pennsylvania MedisGroups data base is one example of a large secondary data set. As seen, however, an important issue in large data base analysis is that they rarely include all the variables needed to answer a particular research question. Important covariates such as patient sociodemographics, comorbid conditions, and functional status can be difficult to determine. Despite these serious informational gaps, large data bases are a valuable resource for health services researches. The great potential of large data bases to influence future health policy makes it essential that they be selected carefully and adhere to rigorous research design standards.

Klea D. Bertakis, MD, MPH  
Sacramento, CA

## References

1. Myers LP, Schroeder SA. Physicians' use of services for the hospitalized patient: a review, with implications for cost containment. *Milbank Mem Fund Q Health Soc* 1981; 59:481-507.
2. Rosenblatt RA, Moscovice IS. The physician as gatekeeper. Determinants of physicians' hospitalization rates. *Med Care* 1984; 22:150-9.
3. Noren J, Frazier T, Altman I, DeLozier J. Ambulatory medical care: a comparison of internists and family-general practitioners. *N Engl J Med* 1980; 302:11-6.

4. Greenwald HP, Peterson ML, Garrison LP, Hart LG, Moscovice IS, Hall TL, et al. Interspecialty variation in office-based care. *Med Care* 1984; 22:14-29.
5. Bertakis KD, Robbins JA. Gatekeeping in primary care: a comparison of internal medicine and family practice. *J Fam Pract* 1987; 24:305-9.
6. *Ibid.* Utilization of hospital services. A comparison of internal medicine and family practice. *J Fam Pract* 1989; 28:91-6.
7. Greenfield S, Nelson EC, Zubkoff M, Manning W, Rogers W, Kravitz RL, et al. Variations in resource utilization among medical specialties and systems of care. Results from the Medical Outcomes Study. *JAMA* 1992; 267:1624-30.
8. MacLean DS. Outcome and cost of family physicians' care: pilot study of three diagnosis-related groups in elderly inpatients. *J Am Board Fam Pract* 1993; 6:588-93.
9. McGann KP, Bowman MA. A comparison of morbidity and mortality for family physicians' and internists' admissions. *J Fam Pract* 1990; 31:541-5.
10. Kravitz RL, Greenfield S, Rogers W, Manning WG Jr, Zubkoff M, Nelson EC, et al. Differences in the mix of patients among medical specialties and systems of care. Results from the Medical Outcomes Study. *JAMA* 1992; 267:1617-23.
11. Epstein AM, Stern RS, Tognetti J, Begg CB, Hartley RM, Cumella E Jr, et al. The association of patients' socioeconomic characteristics with the length of hospital stay and hospital charges within diagnosis-related groups. *N Engl J Med* 1988; 318:1579-85.
12. Greenfield S. The state of outcome research: are we on target? *N Engl J Med* 1989; 320:1142-3.
13. Iezzoni LI, Moskowitz MA. A clinical assessment of MedisGroups. *JAMA* 1988; 260:3159-63.
14. Iezzoni LI, Ash AS, Cobb JL, Moskowitz MA. Admission MedisGroups score and the cost of hospitalizations. *Med Care* 1988; 26:1068-80.
15. Paul JE, Weis KA, Epstein RA. Data bases for variations research. *Med Care* 1993; 31(5 Suppl):YS96-YS102.

## Causes of Rural Hospital Closure

In this issue of the *JABFP*, Pirani, Hart, and Rosenblatt<sup>1</sup> have provided the rural health research, policy, and practice communities with a valuable addition to a growing literature on rural hospital closures. Until their study no national research of which I am aware has surveyed the attitudes and opinions of rural physicians about the causes of rural hospital closure. Thus, the authors add another piece to a puzzle that has caused, and continues to cause, acrimonious debate among the parties of interest: residents and practitioners in communities that have lost or are about to lose their facility; academics and policy analysts who try to put the closure issue into wider, often cost-benefit, perspectives; and rural health care advocacy groups that regard closure as evidence of decreasing commitment by state and federal government to assure access to health services for rural populations.

The results of the Pirani, et al. study are revealing: the majority of physicians in the study

cited, in descending order of importance, government reimbursement policies (such as the Medicare prospective payment system [PPS]), poor hospital management, and general financial problems as the principal reasons leading to closure. At the same time, nearly three-fourths of the respondents agreed that "physician actions were not a significant cause of hospital closure." The authors, comparing these results with those obtained from a similar study they completed that surveyed the mayors of communities with closed hospitals, noted that ". . . both physician and community leaders implicated one another more often than themselves as causes of . . . hospital closure . . ." In short, their study is testimony to a blame-the-other-person mentality. In another study of rural hospitals, my colleagues and I found a similar situation but in reverse; rural administrators, the category of person with whom many of the physicians in the Pirani, et al. study found fault, themselves blamed other groups as contributing to the problems of rural hospitals, including physicians and nurses, especially in respect to recruitment and retention.<sup>2</sup>

Perhaps the most important conclusion from the Pirani, et al. study is not so much the content of the specific attitudes and perceptions of the rural physician sample, but that the direction of their findings is consistent with a tendency documented among other survey groups to assign blame, first, on either large-scale socioeco-

---

Submitted 20 July 1993.

From the Department of Health Services Management, University of Michigan. Address reprint requests to Stephen S. Mick, PhD, Department of Health Services Management and Policy, The University of Michigan, 1420 Washington Heights, Ann Arbor, MI 48109-2029.