has been developed and the hardware is now inexpensive. Future users do not have to pay for the high development costs. In addition to TMR there are at least another five to ten well-tested medical record systems available for purchase. Most, if not all, will work on today's microcomputers. Many have paid a lot of attention to easy data entry, but none yet offers voice recognition technology. Direct entry by physician remains a difficult challenge. Third, medical practice is changing, and these changes are leading to larger groups, to structured decision making, and to increasing competition based on cost and quality. Those with an information-intensive infrastructure are much more likely to succeed. Will TMR give Duke Family Medicine Center a competitive advantage in the managed care marketplace? I hope so. And if so, will managed competition finally spur the widespread adoption of computerized record systems? If this occurs, it will be another proof of Fink's law that four times out of five, the right things happen for the wrong reason (personal communication Donald L. Fink, MD, June 1989).

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Rates, Panels, And Health System Reform

Family physicians have always been experts in collecting information about the kinds of patients and types of diseases seen in practice, but without knowing the underlying size and composition of the practice (a "denominator"), useful applications of these data have been limited. Assum-

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ing that true denominators (i.e., the actual make-up of a practice) were unknowable except in a small number of unusual practice settings (e.g., closed-panel health maintenance organizations [HMOs]), physicians have devised a variety of ways to simulate them. Age-sex registers — records of age and sex of patients seen in a practice — were as close as most physicians could get to a practice denominator. In a traditional health care system, where patients can switch physicians at will, however, an age-sex register is at best a crude tool for understanding much about the population of patients served.[1]

Times have changed. Because of our ever-increasing levels of health care spending, without commensurate improvement in health status, the nation finds itself in a "health care crisis." Health care reform and economic pressures are leading more physicians to operate in managed care settings in which patients enroll into a registered practice. In this context the concept of a patient panel (the denominator) is becoming commonplace and might become the rule. Monthly printouts and immediate on-line subscriber information will tell family physicians exactly who their patients are. In addition to panel-specific information, the systems in which family physicians work will have aggregate data for the entire population served.

The article by Cauthen in this issue of *JABFP* introduces the family practice incidence rate (FPIR), an excellent example of the practice management applications available to family physicians who know their patient panel composition.[2] The FPIR offers an innovative and potentially powerful tool for understanding physician practices, but only if the underlying makeup of the practice is known. As panel size and composition become routinely available, family physicians can use the FPIR to translate and apply epidemiologic and population-based data to their practices. As Dr. Cauthen well illustrates, the FPIR facilitates the use of medical literature in primary care by allowing the ready conversion of largely inapplicable rates into meaningful statistical units relevant to an individual practice. This could assist physicians in focusing their thinking and resources on the most clinically important parts of their practices. Rates such as these could help physicians set priorities.

What other advantages are there to thinking in terms of patient panels and populations? Understanding patient panels and using objective tools like the FPIR allow family physicians to take another look at the concepts of population-based and community-oriented care, long espoused in our research literature but unfortunately not widely implemented in practice.[3-5] In addition, the purchasers of medical services are increasingly demanding accountability: evidence of the value of our efforts and optimal clinical outcomes. Panel-based medicine allows family physicians to measure performance and productivity in more meaningful ways than visit rates, numbers of procedures, and other typical measures of physician activity.

HMOs have been tracking panels and populations for years, of course; some believe that their ability to describe enrollees accurately has been a competitive advantage. Managed care organizations, however, have used aggregate data principally for monitoring costs and utilization, not for clinical purposes. One of the most beneficial uses of practice panels and population-based medicine should be in improving clinical outcomes and quality of care. As the family physician assumes responsibility for the care of a panel of patients, he or she moves from reacting to acute problems (injuries, acute illnesses) into a more proactive role in which preventive care (immunizations, health counseling, screening) and some of the more predictable aspects of chronic disease management (diabetes, human immunodeficiency virus infection, cardiovascular disease) are emphasized. Because it can be anticipated, care can be better planned and more systematic. The goal is the predictable improvement of health outcomes by assuring the delivery of known effective interventions and eliminating unnecessary or inappropriate ones.

If family physicians are truly to be the leaders of health care systems, we will need new tools, such as the FPIR, and new ways of thinking, such as panel- and population-based care. These innovations are stimulating changes in how we practice, teach, and conduct our research. In medical education we will move from the personal and anecdotal to the evidence-based. The challenge that this shift of emphasis will present could become one of the principal intellectual attractions for becoming a family physician. Generalists are best positioned to manage both individual patients and groups and populations. Combining the individual, panel, and population-based perspectives will distinguish family physicians from nongeneralist

physicians and from nonphysician primary care providers, placing us at the powerful center of what makes managed care successful.

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