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## Guest Editorial

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# Learning to Live Without Practice Denominators

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Over the past decade considerable attention has been given to the importance of knowing the number of persons served by a given family practice. Articles, presentations, workshops, and even a book have been devoted to the solution of what has become known as "The Denominator Problem." The primary motivation for these efforts to estimate practice populations seems to have been the belief that the lack of such denominators was impeding important epidemiologic and health services research in family medicine. So far, no widely acceptable method for estimating practice denominators has been identified.<sup>1</sup> Furthermore, it is not clear that the lack of such a method has had a detrimental impact on family practice research. I question the wisdom of continuing to devote re-

sources to the resolution of a problem that may be both insoluble and of limited significance for the progress of family practice research.

Initial concern about estimating practice size arose, not among family physicians in the United States who had found their research efforts frustrated by the lack of practice denominators, but among a group of British and Canadian researchers steeped in the British epidemiologic tradition.<sup>2-5</sup> The use of practice denominators to calculate rates of morbidity or health services utilization is a relatively simple matter in Great Britain, as persons are registered with specific general practices in the National Health Service. Using data from the British National Morbidity Survey, Kilpatrick<sup>4</sup> showed that the distribution of the number of episodes of illness experienced by a large segment of the British population followed a particular mathematical distribution. This finding led to numerous attempts to fit various mathematical models to the distribution of the number of visits or episodes of illness experienced by persons visiting a practice. It has been hoped that a model that fits such a

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distribution could then be used to estimate by backward extrapolation the number of persons with zero visits. The resulting estimate of the number of persons with no visits during a year could then be added to the number of persons who had visited the practice at least once, thereby yielding an estimate of the total practice denominator.

Other investigators have suggested a simpler approach to estimating practice size. This "correction factor method" would require only that records be maintained on the number of individuals in specific age and sex categories who had visited the practice in the previous 12 or 24 months.<sup>6,7</sup> The main assumption underlying this approach is that the proportion of persons in age- and sex-specific groups who visit a physician in a 12- or 24-month period is similar from practice to practice. Although there is some support for this assumption, the authors raise some troubling concerns.<sup>7,8</sup>

There are several reasons for the failure of these approaches to the denominator problem to produce a satisfactory solution and for the unlikelihood that any generally useful method will be devised.

The first problem is conceptual: what is a practice population in the context of medical practice in the United States? Health maintenance organizations (HMOs) have known practice populations, and hence, no need to estimate them. However, the predominant mode of practice in the United States is still fee-for-service and is characterized by the lack of a formal relationship between an individual and a physician or practice. Free patient choice of physician and open access to consultant physicians has been a hallmark of medical care in the United States. Thus, the theoretical (or the British) concept of a registered practice population has no analogue in most medical practices in the United States. This fact prompted a leading authority on the denominator problem to conclude that "a practice population is a nebulous concept: it is undefinable and cannot consistently be estimated," and that "under the present health care system, we cannot use encounter records to do population-based research."<sup>9</sup>

A second problem is technical in nature. Even if one assumes that a practice population exists, how confident can one be that any particular method for estimating it is accurate? Indeed, how could the accuracy of a method be measured? In the United States there is no "gold standard" against

which denominator estimates can be compared. It has been argued that estimation methods should be evaluated using data from health maintenance organizations in the United States.<sup>10</sup> In view of the many differences between the HMO and the typical fee-for-service practice in the United States (eg, primary physicians' gatekeeper role, prepayment, lower hospital utilization), HMOs would seem to be an inappropriate standard.

The third problem is a practical one. The denominator problem is, in essence, a rate calculation problem. Denominators as such are not very useful, but they are a necessary component for the calculation of rates of morbidity or health services utilization. The other essential component in the calculation of such rates, the numerator, also suffers from conceptual and measurement problems. It is not possible to calculate credible *population-based* rates using morbidity or utilization data from fee-for-service practices. This would be true even if one could accurately estimate the practice denominator, since many factors prevent accurate and valid estimation of the required numerators: individuals with health problems may not seek any care, may seek care from nonphysicians, or may refer themselves directly to other specialists. The proportion of persons in a population who refer themselves to a specialist for a problem are likely to be dependent on the nature of the illness, the scope of the primary care physician's practice, and the availability of specialists in the community. In sum, both the numerator problem and the denominator problem need resolution before credible population morbidity or utilization rates can be calculated using practice-based data.

So where should research on the denominator problem go from here? In view of the problems described above, it is not clear that it should go anywhere. That practice denominators exist only in theory, that there is no reliable standard against which to evaluate the accuracy of proposed methods of estimating the denominator, and that practice-based morbidity numerators are seriously deficient all undermine the credibility of using practice-based data to make statements about populations. This does not suggest that all epidemiologic or health services research is impossible in the practice setting, only that there are limitations to the types of research appropriate in practices without known practice populations and without restrictions on the use of multiple sources

of care. Clinical trials, case-control studies, cohort studies, studies of the natural history of disease, and family studies, among others, do not require known practice populations or numerators and can be performed in primary care practices.

Although a widely applicable method for estimating practice denominators is not likely to be found, denominators for specific practices can be derived in certain limited situations. For example, Anderson et al<sup>11</sup> estimated, through the use of a community survey, the number of persons served by a small isolated practice in rural Canada. Unique circumstances also exist in Olmstead County, Minnesota, where diagnoses and surgical procedures performed on county residents by

virtually all medical care providers are indexed and retrievable.<sup>12</sup> Unfortunately, research conducted in those atypical settings from which such denominator estimates can be derived may not be applicable to other settings. In addition, community surveys can be very expensive.

Many research questions can and should be addressed by family physicians. Very few of these require knowledge of the number of persons served by particular practices. In view of the conceptual, technical, and practical problems that make valid and reliable solutions to the denominator and numerator problems unlikely, if not impossible, why not spend our time on more promising and soluble problems?

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