

Geographic Distribution of Physicians In Canada

Prepared for Health Canada by:

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Executive Summary

Geographic distribution of physicians is a major health care issue. For developed countries, including Canada, there is a general belief that the overall supply of physicians is adequate but there is an uneven distribution of physicians, with rural, small and remote areas having an inadequate supply. In light of this concern, the general objective of this study is to describe and analyze the geographic distribution of physicians in Canada, with particular attention to rural and remote areas. Based on an extensive review of the literature and statistical analyses of physician supply data provided by the Canadian Institute for Health Information, this report has three goals:

1. To review and synthesize the literature on the geographical distribution of physicians with a particular focus on rural Canada;
2. To enumerate and map the locations of Canada's physicians, illustrating, data permitting, some of the various methodologies that are highlighted in the literature review; and,
3. In spotlighting data deficiencies, to propose future research projects that may assist researchers and policy makers in evaluating the geography(ies) and measuring the "fairness" and/or "maldistribution" of physicians in Canada.

The geographic distributions of physicians (in total and by specialist categories) are portrayed in this report by mapping their practice locations in Canada for 1996. The 54,958 physicians that have been mapped represent an increase since 1986 of 20.5% in the total number of physicians. During that same decade, the overall Canadian population increased by only 13.9%. It is the relationship between these two phenomena that is of interest. Although the physician location maps are the building blocks for the geography of Canada's physicians, it is the spatial distribution of physicians relative to the spatial distribution of the population that is of critical importance.

To examine this association, the population-to-physician ratio is the most commonly used measure in research and in health services planning. Simple population-to-physician ratios are used by many researchers and health services planners because they are simple to construct and easy to understand. Based on the Southam Database, the population-to-physician ratios in Canada are decreasing numerically in most cases. Taking all physicians together, the ratio has changed from 555 in 1986 to 516 in 1991, a significant drop in five years, then a slight increase again in 1996 to 524. Similar patterns exist when only examining the ratios for the totals of all specialist physicians.

The pictures presented by population-to-physician ratios may be somewhat oversimplified or even misleading. This is because simple head counts of physicians and people within an arbitrarily defined area often obscure the underlying complexity of the situation (e.g., failure to take into consideration differences in physician productivity, mobility of physicians and patients, physicians practising beyond the scopes of their specialties, substitution by other providers, the medical needs of the population, etc.). This paper examines some of those inadequacies as they have been reported in the literature and through numerical and mapped illustrations of the situation in Canada.

A more realistic assessment of the geographic distribution of physicians requires a better understanding of the conceptual and methodological aspects of measuring physician and population dispersion. The first step in advancing this area of research, as well as policy and program development in rural health care, is to enhance our ability to more accurately describe the geographic distribution of physicians and to take into account factors that impinge on care-providing and care-seeking behaviours.

The literature shows that researchers have adopted two different approaches in refining the measures of physician distribution. First, it is worthwhile pointing out that a typical population-to-physician ratio contains three pieces of information, both implicit and explicit: The *geographic area* within which the physicians and people are located, the *number of physicians* and the *number of people*. Refinements of the ratio are attempts to conceptually clarify these three variables and to more accurately measure them. Second, some researchers prefer to avoid the need to define a geographic area altogether. Instead, the distributions of physicians and population are described in terms of distances between people and physicians.

Both of these approaches are critically examined using numerical/mapped examples and by examining the experiences of others throughout many parts of the world as recorded in the literature. In particular, in this report we examine refinements to: geographic area - in terms of various statistical/administrative units and their characterization in terms of “rurality”; number of physicians - in terms of the concepts and difficulties of using full-time equivalent measurements (particularly those derived from the National Physician Database), “optimal” numbers of physicians by speciality, and provider substitution; number of people - in terms of age, gender, utilization patterns; distance - in terms of summary measures of the median distances that Canadians must travel to access general practitioners/family medicine physicians, physician specialists, and hospitals. Population-to-physician ratios themselves can also be transformed into more sophisticated measures that can assist with assessments of equitable distributions. Here we have illustrated the application of one such measure, the Gini coefficient, and demonstrated the problems of its application. As well, a number of scenarios are constructed that utilize combinations of distance measurements and “optimal” population-to-physician ratios.

The empirical results of the analyses in this report clearly show that physicians in Canada are not evenly distributed and that the uneven distribution is particularly acute with respect to specialist physicians in rural and remote areas. However, it is also argued that the uneven distributions or “maldistributions” that are portrayed are based on assumptions that can be contested and on indices that can be improved with additional data inputs. Designations of physician shortage or maldistribution have to be made against some standards of adequacy. Unfortunately, there are as yet no universally accepted standards. Further, it is not possible for this study, based mostly on physician supply data, to assess difficulties experienced by Canadians in accessing physician services. The level of difficulty in accessing medical care is a function of many factors, the number of physicians in an area is just one of those. And finally, this study cannot document the social or economic impact of lack of access to physician services as this is another area where hardly any research has been done.

Future work on the geographic distribution of physicians in Canada should include refinements to the empirical analyses presented here and seek to close the major research gaps we describe that deal with: data inadequacies or availability; provider substitution; full-time equivalent definitions; the measurement and concepts of distance in terms of access; the potential impacts of electronic “travelling” or telehealth; and the complex inter-relationships between physician availability, utilization and health status.

In our opinion, it would be extremely useful to conduct a comparative study of six to ten rural communities across the country in relation to access to physician services. The study would not focus entirely on the number of physicians and where they are located. Instead, it would examine what the physicians do and how they do it, their concerns and how they think medical care can be improved, how residents in the studied communities access services and to what extent they access services, the residents’ assessment of their health care needs, their perception of the availability of physician services and their adequacy, etc. In addition, as health care delivery is not an isolated activity, the study would examine how the seeking and delivering of medical care interrelate with other activities and how health care as an institution is meshed with other institutions. In other words, a considerable amount of “contextual” data would need to be collected. Needless to say, such a study would have to rely on both quantitative and qualitative research methodologies. Where feasible, it would use secondary data from various sources. As well, it would rely on primary data collected through surveys, interviews, focus groups and observation. Such a comparative study should yield a wealth of information about the problems of access to physician services in rural areas and how such problems are perceived and dealt with differently in different communities. Such information would supplement the type of information and data examined in the present study.