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The effect of physician supply on health status: Canadian evidence

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ABSTRACT

We estimate the relationship between per capita supply of physicians, both general practitioners and specialists, and health status of Canadians. We use data from the Canadian National Population Health Survey and the Canadian Institute for Health Information. Two measures of quality of life, self-assessed health status and the Health Utility Index, are explored. Random effects ordered probits are used to model self-assessed health status, and quantile regressions are used for the Health Utility Index. A higher supply of general practitioners is correlated with better health outcomes as measured by both measures of health status, albeit for different age groups, and it is correlated with a higher HUI for some individuals who report having a chronic condition. A higher supply of specialists is correlated with worse health outcomes for the HUI for some individuals. It is possible that a higher supply of general practitioners increases the likelihood of diagnosing and treating health conditions in a timely manner and that this in turn affects health status. Specialists, due to the nature of their expertise could affect negatively health, both through the use of riskier procedures and due to their clientele being in relatively worse health. Based on our findings, we therefore would recommend maintaining a robust supply and distribution of GPs across Canada.

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1. Introduction

The supply of physicians across Canada, particularly in remote areas, has been a much-publicized issue in the health care debate. Media reports in the 1990s depicted a brain drain towards the US, suggesting that remote areas especially had trouble attracting physicians and convincing them to remain once they had started practicing. Since then, the exodus towards the US has subsided [1] and even rebounded [2,3]. Do more physicians in an area lead to better health outcomes? This is what this paper explores.

Little Canadian research has explored either how physician supply affects health status or which types of doctors (general practitioners (GPs) vs. specialists[1]) have the greatest effect on health status. Most studies examine how physician supply affects individuals with specific health problems in the US and find that a higher supply of GPs is associated with better health outcomes [4–12]. However, some researchers [13] do not find such a relationship concerning avoidable mortality using OECD data, and others

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[1] We use the term GP for both family physicians and general practitioners.

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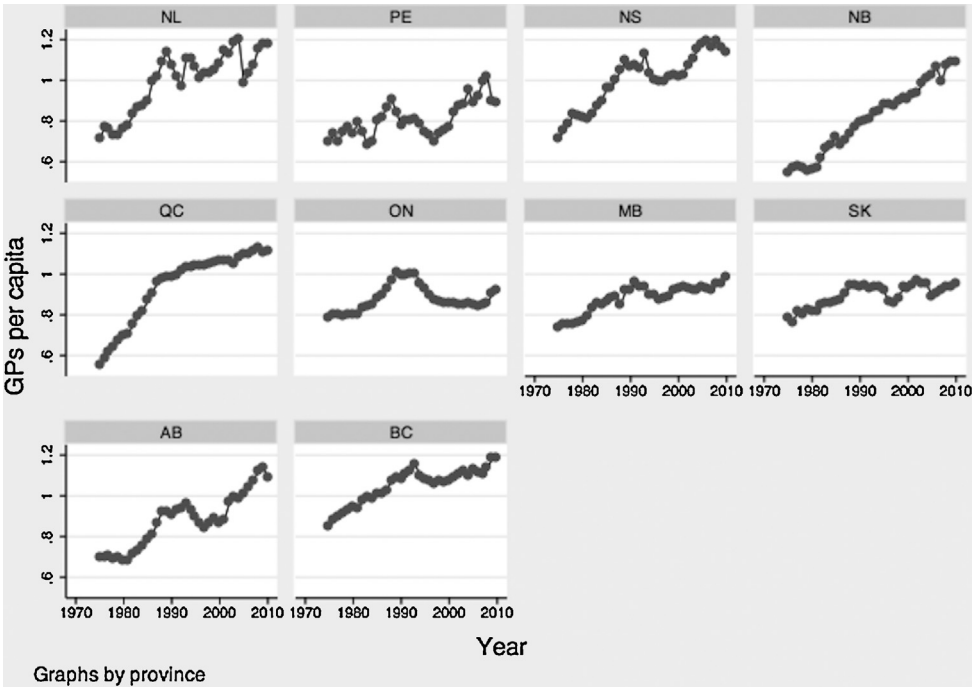

Fig. 1. Number of GPs per capita: 1982–2010.

[14] find a negative association between Hospital Standardized Mortality Ratios and the supply of GPs in Holland. Sundmacher et al. [15] find that a higher supply of physicians is correlated with small decreases in avoidable deaths rates due to some cancers. Sarma and Peddigrew [16] using cross-sectional Canadian data find a positive relationship between GPs and specialists supply and general health, while Shi et al. and Shi et al. [11,12] find that a higher supply of primary care physicians is associated with a higher probability of reporting good self-rated health.

The evidence for specialists is mixed, as a higher supply is either beneficial [5] or detrimental [4], depending on the outcome studied. Some studies [17,18] find that a higher supply of physicians is correlated with a higher use of some services - but not necessarily all of them [17]. Other studies [19,20], using the mortality of individuals with specific health problems, find that being admitted or treated by a specialist is associated with a lower risk of mortality. Others [21–24] find no difference in outcomes of most patients.

Our paper differs from the existing literature in a number of ways. First, we use panel data concerning the health of the general Canadian population, rather than focusing on individuals with a specific condition. These data enable us to study an individual's overall health status, instead of measures of specific outcomes (mortality rates, complications, stage at diagnosis) or acute health problems. These data also enable us to control for socioeconomic status at the level of the individual; previous studies have typically used the average of the variable over a geographical unit. Most studies have used American or European data. The universal nature of the public health insurance system in Canada makes it easier to estimate this supply effect. Second, we are interested in the health of individuals while they are living, and hence avoid basing our study solely on mortality rates, which has generally been the case in previous literature. Third, we take into account the endogeneity of physician supply, which has not typically been done in previous studies (one notable exception is Auster et al. [25]). Fifth, we control for past health status and include interaction terms between age, the presence of a chronic condition and physician supply, which has not been done in most of the existing literature. We estimate a reduced form model in which present health status is a function of both past health and current individual-specific risk factors, and provincial physician supply.

As can be seen in Fig. 1, there was a decrease in per capita GP supply in the mid-1990s across many provinces, although the general tendency over time is for the supply of GPs to increase. Comparatively, specialists supply remains relatively stable over the period although it also increases slightly in most provinces, as is clearly evident in Fig. 2. These exogenous changes in health resources enable us to estimate the effect of fluctuations in physician workforce on health status.

Our findings confirm some of those achieved in the literature: a higher supply of GPs is correlated with better health outcomes for some individuals, while a higher supply of specialists is correlated with worse health outcomes as measured by the HUI for the bottom end of the distribution. This is consistent with most of the existing American literature as well as some more recent related papers [26]. We also find that having a diagnosed chronic condition is correlated with worse health for the HUI but a higher GP supply is correlated with a higher HUI for some of these individuals. Finally, we find that there is no consistent difference in the impact of physician supply for different age

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