

# Productivity of Primary Care Physicians in Ontario



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## Introduction

The first model to look at physician productivity was developed by Reinhardt<sup>1</sup> and used the number of physician visits in a week as the output:

$$Q = f(H, X_1, X_2, \dots, X_n)$$

Where *H* is the physician's time in hours, and the *Xs* correspond to quantities of other inputs used by the physician to produce the outputs such as capital, material, other technical or administrative providers.

Previous models estimating the effect of various factors on physician productivity found the following:

- Higher productivity in group practices<sup>1,2</sup>
- Lower productivity with salary-based payment<sup>3,4</sup>
- RN provide the highest marginal productivity compared to technicians and medical secretaries<sup>5</sup>
- Practices with both primary care (PC) and specialty care services are less efficient than PC-specific (or specialist-specific) practices<sup>6</sup>

## Objective

Explore factors affecting primary care physician productivity in Ontario, where productivity is defined by the number of daily consultations.

## Methods

### Data Source: The QUALICOPC Study:

- An international study of quality and costs of primary care involving 34 countries including Canada.
- Primary care physicians (PCPs) in Ontario were recruited on a voluntary basis through the Ontario College of Family Physicians. Self-selected physicians were sent a package with surveys about characteristics of their practice as well as information on themselves.
- Data collection occurred from January to November of 2013.
- 185 Ontario PCPs participated in the study.

### Variables:

#### Outcome variables:

- Q1: number of face-to-face consultations in a day
- Q2: total number of consultations in one day (including emails and phone calls)

#### Explanatory variables:

- # of hours worked, average time per consultation, size of practice population
- Practice characteristics: location, # of nurses

#### Statistical Analysis:

- Ordinary least squared regressions for each outcome variable (Q1 & Q2):  
$$Q = f[\text{Physician\_hrs}; \text{nurse\_FTEs}; \text{size\_practice}; \text{\#patients\_rostered}; \text{patient\_characteristics}; \text{consult\_time}; \text{rural\_location}]$$

Productivity is a function of the hours worked by the physician, and the explanatory variables.

## Results

Table 1. Descriptive Statistics

| Variable                             | Mean (std. dev.) |
|--------------------------------------|------------------|
| Age                                  | 63.4 (10.3)      |
| Gender = male                        | 43%              |
| Born in Canada                       | 67%              |
| Part of a new primary care model     | 71%              |
| Size of practice population          | 1,631 (1389)     |
| # of patients rostered               | 1,286 (1094)     |
| Hours worked in a week               | 40.4 (11.3)      |
| Hours of direct patient care         | 36.7 (10.9)      |
| # of daily patient contacts:         | 30.9 (12.9)      |
| - face-to-face, in office            | 26.3 (10.7)      |
| - By telephone                       | 4.0 (4.3)        |
| - By email                           | 0.6 (1.5)        |
| Duration of a regular consult in min | 14.7 (4.9)       |
| % Receiving remuneration from:       |                  |
| - Salary                             | 36%              |
| - Capitation payments                | 76%              |
| - FFS                                | 80%              |
| - Out-of-pocket                      | 65%              |
| - Performance payments               | 68%              |
| - Other sources                      | 45%              |
| Shared practice                      |                  |
| - With other FPs/GPs                 | 84%              |
| - With other specialists             | 11%              |
| - With other non-MD care providers   | 27%              |
| Practice location:                   |                  |
| - City                               | 27%              |
| - Suburb                             | 23%              |
| - Small town                         | 21%              |
| - Mixed                              | 15%              |
| - Rural                              | 13%              |
| # consultation rooms                 | 8.0 (6.7)        |
| # FTE medical secretaries            | 3.1 (2.8)        |
| # FTE nurses (RN+ NP)                | 2.1 (2.3)        |
| # FTE other providers                | 2.5 (3.3)        |

## References

<sup>1</sup> Reinhardt U, A Production Function for Physician Services, The Review of Economics and Statistics, 1972;54(1):55-66; <sup>2</sup> Pope GC, RT Burge. Economies of scale in physician practice. Medical Care Research and Review. 1999;53(4):417-440; <sup>3</sup> Devlin R, S Sarma (2007). Do physician remuneration schemes matter? The case of Canadian Family Physicians. Canadian Health Economics Study Group; <sup>4</sup> Lewandowski S, PJ O'Connor, LI Solberg, T Lais, M Hroschikowski, JM Sperl-Hillen, Increasing Primary Care Physician Productivity: A Case Study, Am J Man Care, 2006 Oct;12(10):573-6; <sup>5</sup> Thurston NK, AM Libby, A Production Function for Physician Services Revisited, The Review of Economics and Statistics, 2002;84(1):184-191; <sup>6</sup> Rosenman R, D Friesner, Scope and scale inefficiencies in physician practices, Health Econ. 2004;13(11):1091-1116

## Results (Continued)

Table 2. Factors affecting physician productivity

| Variable/Outcome                                                           | Face-to-face consultations | All consultations |
|----------------------------------------------------------------------------|----------------------------|-------------------|
| Size of practice population                                                | 0.006***                   | 0.007***          |
| # of patients rostered                                                     | -0.006***                  | -0.007**          |
| Proportion of patients who are socially disadvantaged                      | 1.42                       | 1.36              |
| Proportion of patients of ethnic minority                                  | -0.29                      | -0.88             |
| Direct hours spent on patient care (per week)                              | 0.20**                     | 0.26**            |
| Consultation time (in min)                                                 | -1.00***                   | -1.11***          |
| Practice located in rural area                                             | -3.66*                     | -5.35*            |
| Total FTE nurses                                                           | -0.82**                    | -0.73*            |
| Adjusted r-squared                                                         | 0.53                       | 0.46              |
| ***significant at p<0.000; **significant at p<0.01; *significant at p<0.05 |                            |                   |

## Discussion

- Consultation time and location of the practice in a rural area are the factors with the highest coefficients, indicating they have the greatest influence over consultation volume.
- Physicians with a larger practice population and those spending more hours on direct patient care are more productive;
- Having more patients who are socially disadvantaged or from an ethnic minority does not affect physician productivity;
- Physician characteristics (age, gender, born in Canada), and payment and practice models did not directly affect physician productivity; this may be due to high correlation between these and the average consultation time and other variables included in our models.

### Study limitations:

- Survey limitations: self-selection of physicians into the study, physicians' own bias, limited number of respondents;
- no linkage of data to other data sources to adjust for patient characteristics and ensure validity of the numbers of consultations, size of practice population, patients rostered.