PCSI 2025
Québec, Canada
September 9 to 12

Application of Case-Mix Methodology for Population-Based Physician Workforce Planning in Ontario, Canada

Authors: Li Jiang (a), Yin Li (a), Thomas Fruehauf (a), George Marusic (a), Jasmin Kantarevic (a), Lyn Sibley (a)

Introduction

Physician workforce planning is a complex and multi-faceted process that is crucial for improving the efficiency and resilience of the health-care system. Historically, physician workforce modelling has been predominately supplydriven. Using the case-mix classification system available in Canada, the Ontario Medical Association (OMA) developed the Physician Resources Integrated Model (PRIME) to support physician workforce planning with a focus on population health needs.

PRIME comprises two key modules. The supply module projects the active physicians in the workforce, while the demand module models the workforce required to meet the population's unique needs. This abstract focuses on the demand module, which aims to identify the current and future demands for physician services in the province of Ontario.

Methods

PRIME mobilizes the best available data related to population health, health services utilization, and the physician workforce. The data sources include a population-based registry, physician billing claims data, and inpatient and outpatient hospital records. All the Ontario residents with health insurance coverage from April 1, 2023 to March 31, 2024 were included in the analysis. The health statuses of Ontario residents were measured using the Canadian Institute for Health Information (CIHI) population grouping methodology. The target service level was established through benchmarking. A linear regression model was employed to estimate the annual number of physician visits required to meet patients' unique needs, based on their demographics, health statuses, and the target level of service. The relative shortages in physician services were identified as the difference between what patients currently receive and what they would have received, as estimated by the model.

Results

The analysis for the fiscal year 2023/24 revealed a substantial service gap of around 8.4 million physician visits to reach the service level of the Ontario average. This shortfall represents approximately 6% of the existing physician workforce. The three physician specialties experiencing the most significant shortages were family medicine, psychiatry, and paediatrics. There was regional variation in current physician shortages. Relative to the Ontario average benchmark level, our estimated gaps ranged between 3% and 16% of the current physician service provision across regions. This gap should be interpreted as an indicator signalling a potential problem that needs to be discussed within a holistic, multifactorial policy framework.

Discussion/Conclusions

We leveraged extensive individual-level data and an established case-mix classification system to model physician service demands. The PRIME model responds to a need for tools that leverage data analysis and visualization to support health system optimization and promote the culture of planning in Canada.

a: Ontario Medical Association, Canada