

Physician Resources Integrated Model (PRIME) Dashboard:

An Interactive Tool for Physician Workforce Planning in Ontario, Canada

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Background

- Canada has a publicly funded health-care system, and the management, organization, and delivery of health-care services fall under provincial jurisdiction
- Physician workforce planning is a complex and multi-faceted process and is pivotal to improving the efficiency and resilience of the health-care system
- The **Physician Resources Integrated Model (PRIME)** is a comprehensive tool that seeks to guide and support stakeholders in identifying policies to align the capacity of the health workforce to meet population health needs under current and different future scenarios

Objective

One objective of PRIME is to identify the current gap in physician services in Ontario by comparing the actual and target physician services.

Data Sources and Variables

Data & Software

- Ontario Health Insurance Plan (OHIP) Billing Claims Data
- Registered Persons Database
- Hospital Discharge Abstract Database
- National Ambulatory Care Reporting System
- Continuing Care Reporting System
- Home Care Reporting System
- CIHI Population Grouping Methodology Software

Population

- Residents of Ontario with Ontario Health Insurance Plan (OHIP) coverage between April 1st, 2021 and March 31st, 2022
- Exclusion Criteria
 - Non-Ontario postal code
 - Born after March 31st, 2022 or deceased before March 31st, 2022
 - Aged 130 and older
 - No OHIP coverage on March 31st, 2022
 - Missing age, gender, or postal code

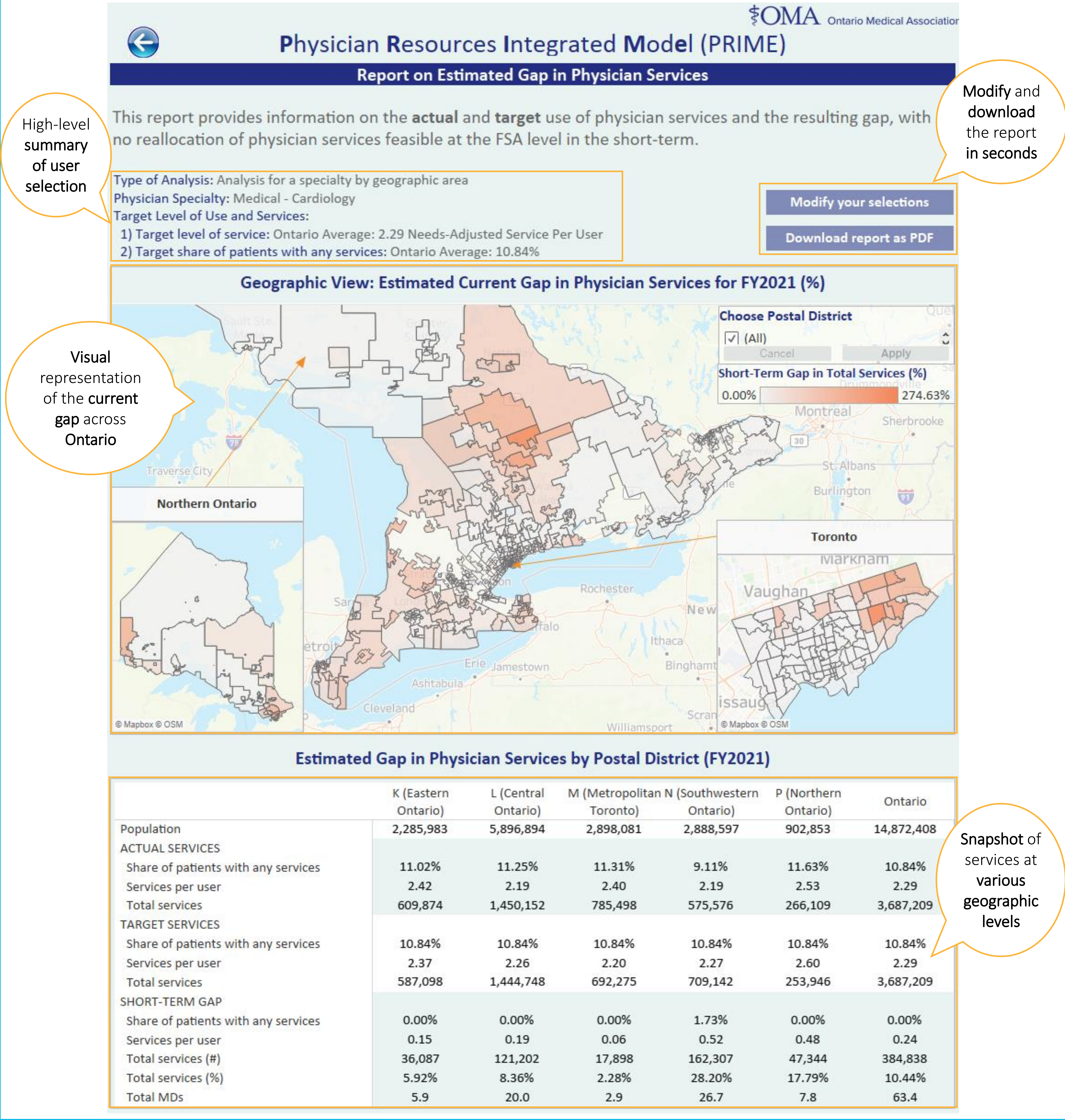
Use of Physician Services

- Measured as the number of visits to physicians

Predictive Features

- Need factors: age, gender, 226 health conditions, 460 interactions between health conditions
- Non-need (area-level) factors: median household income, share of households without income, marital status, education (university degree and above), unemployment rate, visible minority, indigenous identity, no knowledge of English or French, mother tongue (English or French), immigration status

Sample of Interactive Dashboard Output



Choice of Benchmark Value

- In needs-based approaches to projecting health-care service requirements, planners estimate workforce requirements to meet the unique needs of patients, based on their demographic and epidemiological profiles and an 'appropriate' level of service
- We adopt a pragmatic approach by providing stakeholders with *the predicted use of services* for each of the benchmark regions and letting them choose the region that most closely reflects their view of the 'appropriate' level of a given service
- We also provide the option of directly specifying the appropriate level of service

Estimation Method

- The ordinary least square (OLS) linear regression models were fitted
- The target use of physician services was estimated through criterion-based benchmarking, where the values of non-need features were set to the mean of the benchmark region or user-specified criterion

Summary of Results

- The sample consisted of 14,872,408 Ontario residents
- In Fiscal Year 2021–22, approximately 63 more cardiologists were required to address the unmet needs of the population to match the Ontario average level of services
- Southwestern Ontario appears to have the greatest shortage of cardiologists with an estimated gap of 27 physicians

Interpretation and Limitations

- Securing additional physicians is one policy intervention to address the short-term gap, but this intervention may be difficult to operationalize in the short term, and may be insufficient to address the current gap if other inputs are not available, such as required infrastructure and allied health professionals
- The magnitude of the need for additional physicians - and associated interventions - are influenced by factors such as the substitutability of services between physicians in different specialties and between physicians and other healthcare providers, the distribution and productivity of currently active physicians, the available technology to treat specific medical conditions, and others
- Therefore, the estimated gaps in this report should be interpreted as indicators signaling a potential problem that needs to be discussed within a holistic, multifactorial policy framework

Conclusion

The PRIME model and interactive dashboard respond to a need for tools that leverage data analysis and visualization to support health system optimization and the culture of planning in Ontario.