Toronto Region Primary Care Workforce Planning Toolkit

Full Technical Notes

Project Description

The Toronto Region Primary Care Workforce Planning Toolkit is a fit-for-purpose toolkit to support integrated primary care workforce planning in the Toronto Region. The toolkit is the result of a collaboration between the Health Analytics team at Ontario Health Toronto and consultants from the Canadian Health Workforce Network. A partnership with the City of Toronto, as well as extensive consultation with stakeholders, decision-makers, leaders, and frontline workers in Toronto, informed the development of the toolkit.

The toolkit provides a body of evidence around the current (and projected future) states of population health needs and primary care service provision at a neighbourhood level within the City of Toronto. The goal of the toolkit is to support evidence-based decision-making, particularly with regards to deployment of the primary care workforce and other health system resources. The toolkit looks at population needs and workforce capacity at the neighbourhood, sub-region, and whole city levels. It takes into account variations in population needs, workforce service capacity, and existing assets, and also addresses challenges specific to Toronto, such as patient mobility, anticipated rapid population growth, and physician retirement.

Methodology

The toolkit is composed of a series of modules that assemble information about primary care in the City of Toronto:

- The Population Health Profiles Module captures characteristics of the population that impact the need for primary care services.
- The Population Growth Module captures neighbourhood-level population growth projections generated by the City of Toronto, allowing us to adjust service requirements to account for anticipated population growth.
- The Spatial Patterns of Utilization Module captures a snapshot of primary care utilization patterns and allows us to adjust service requirements to account for patients’ care-seeking behaviours.
- The Unmet Need Module captures information related to neighbourhood-level unmet healthcare need, which can contribute to an adjustment of service requirements.
- The Service Requirements Module estimates primary care service requirements using the CIHI Population Grouping Methodology.
- The Workforce Profiles Module captures information about the primary care workforce – including physicians, chiropodists, dieticians, midwives, nurse practitioners, optometrists, occupational therapists, pharmacists, psychologists, physiotherapists, registered nurses, registered practical nurses, respiratory therapists, and speech-language pathologists – practicing in each neighbourhood.
- The Service Capacity Module estimates the capacity of the workforce to provide primary care services.

Outputs from these modules are synthesized and summarized in the static dashboards and maps that are included in the neighbourhood, subregion, and city profile packages.

This information is a starting point for local stakeholders wishing to better understand the primary care landscape in their communities. Interpretation of these outputs should consider the local context (factors related to both the community and the local workforce). Engagement and consultation with local stakeholders and frontline healthcare providers are essential parts of the planning process.
Definitions

Sub-Regions: Smaller geographic planning regions within Ontario Regions, developed to help better understand and address patient and population needs at the local level. There are 5 central and 6 peripheral sub-regions in the City of Toronto. One sub-region overlaps with a neighbouring Region and only the part of this sub-region located in Toronto has been included in these analyses. More information about sub-regions is available at http://www.torontocentrallhin.on.ca/forhsp/subregions.aspx.

Neighbourhoods: The 140 City of Toronto neighbourhoods were built by the Social Development, Finance & Administration department at the City of Toronto using Statistics Canada Census Tracts. More information about neighbourhoods is available at https://www.toronto.ca/city-government/data-research-maps/neighbourhoods-communities/neighbourhood-profiles/.

Comprehensive care physician: Primary care physicians who provide comprehensive care according to the algorithm developed at ICES (https://www.cmajopen.ca/content/5/4/E856).

Non-comprehensive care physician: Primary care physicians who practise less than 44 days per year or who otherwise do not meet the criteria to be characterized as providing comprehensive primary care according to the algorithm developed at ICES (https://www.cmajopen.ca/content/5/4/E856).


Neighbourhood-level Service Requirements: Service requirements are estimated and projected on a neighbourhood-by-neighbourhood basis. Neighbourhood-level service requirements are a function of the number of visits to a primary care physician required by neighbourhood residents and by residents of other neighbourhoods in the City, adjusted for spatial patterns of utilization and population growth, along with the number of visits utilized by patients from outside the City of Toronto.

In a given neighbourhood, x, in a given year, the equation describing service requirements is as follows:

\[ V_{TOT,Nx} = (V_{RES,Nx})(P_{RES,Nx}) + \sum (V_{NRES,Nn})(P_{NRES,Nn}) \{n=1-140 | n \neq x\} + V_{NCITY} \]

- \( V_{TOT,Nx} \) is the total number of visits required
- \( V_{RES,Nx} \) is the number of visits required by the resident population
- \( P_{RES,Nx} \) is the proportion of visits that are received in the home neighbourhood
- \( V_{NRES,Nn} \) is the number of visits required by residents of Neighbourhood Nn, where n ranges from 1-140 but does not include x
- \( P_{NRES,Nn} \) is the proportion of primary care residents of Neighbourhood Nn receive in Neighbourhood x, where n ranges from 1-140 but does not include x
- \( V_{NCITY} \) is the number of visits received in the Neighbourhood x by patients residing outside the City

Total Service Capacity: Neighbourhood-level service capacity is a function of the estimated number of visits provided by comprehensive care physicians who are not expected to exit the workforce, plus the estimated number of visits provided by comprehensive care physicians who are considered to be at risk of retirement, plus the estimated number of visits provided by non-comprehensive care physicians.

Physician Service Capacity: Physician service capacity is estimated on an individual level (based on the total number of visits provided in 2017 (from IPDB)) with adjustment for age-based changes in workload (from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6516703/) and aggregated to the neighbourhood level.
**At-risk Service Capacity:** Visits associated with physicians whose age-based risk of retirement is at least 20%. In the interactive retirement scenario dashboard, alternative retirement probability threshold scenarios can be explored (15%, 20%, 25%, 30%, 35%).

**Allied Health Provider:** Allied health providers include Chiropodists, Dieticians, Midwives, Nurse Practitioners, Optometrists, Occupational Therapists, Pharmacists, Psychologists, Physiotherapists, Registered Nurses, Registered Practical Nurses, Respiratory Therapists, and Speech-Language Pathologists.

**Primary Care Activities:** Activities relating directly to primary care include General Service Provision, Continuing Care, Comprehensive Primary Care, Chronic Disease Prevention and Management, Public Health, Mental Health and Addiction, Primary Maternity Care, Geriatric Care, Infectious Disease Prevention and Control, and Palliative Care.

**Allied Health Provider Service Capacity:** The primary care service capacity generated by a single registered professional in a given year (y) in a given neighbourhood (n) can be calculated using the following equation:

$$SC_{yn} = \frac{\text{number of weeks worked} \times \text{# of hours worked per week} \times \% \text{ of time in direct professional services}}{52 \times \text{number of practice settings}} \times \text{number of settings in neighbourhood n associated with a primary care activity}$$

The service capacity generated by an entire occupational group in a given year (y) in a given neighbourhood (n) that can be allocated to primary care activities can be calculated by summing the $SC_{yn}$ of all of its constituent professionals.

**Average Weekly Hours Available:** The average weekly hours of direct professional services in activities identified as relating directly to primary care, estimated based on past hours worked. Note that this estimate represents normal hours of service that the workforce undertook, not "potential" or "extra" available hours. These are descriptive estimates, not projections, and may not represent future workforce service capacity.

**Sources of Data**

- **Population Health Profiles:** Ontario Community Health Profiles Partnership (OCHPP)
- **Ontario Marginalization Index:** OCHPP
- **Population Growth:** City of Toronto Planning Department
- **Unmet Need:** OCHPP
- **Spatial Patterns of Utilization:** Utilization Matrix generated using data from ICES through an AHRQ request
- **Service Requirements:** CIHI Population Grouping Methodology outputs provided by the Ontario Ministry of Health
- **Primary Care Workforce Profile & Service Capacity (Physicians):** ICES Physician Database (IPDB) accessed through OCHPP
- **Primary Care Workforce Profile & Service Capacity (Other Health Professionals):** Health Professions Database (HPDB) outputs provided by the Ontario Ministry of Health

**Assumptions**

Service requirements are estimated assuming a Medium population growth scenario and a 10-year horizon.

We assume linear residential development and population growth between the base year and the horizon year.

In our baseline scenario, we assume that new residents of a neighbourhood will have a similar profile and service requirements to those currently residing within the neighbourhood.

We adjust for population mobility using a snapshot of spatial patterns of utilization observed in FY 2017/18.

We assume that providers’ age-based changes in workload and retirement probabilities will be consistent with those observed in comprehensive primary care physicians practicing in Ontario between 1992 and 2013 (from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6516703/).
Limitations

Neighbourhood geographies are not specifically designed for primary care health workforce planning.

Some neighbourhoods are split between subregions. In these cases, neighbourhoods have been assigned to a single subregion as follows:

<table>
<thead>
<tr>
<th>Neighbourhood Name (Number)</th>
<th>Split Between Sub-Regions</th>
<th>Assigned To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kingsview Village-The Westway (6)</td>
<td>North Etobicoke Malton West Woodbridge &amp; North York West</td>
<td>North Etobicoke Malton</td>
</tr>
<tr>
<td></td>
<td></td>
<td>West Woodbridge</td>
</tr>
<tr>
<td>Willowridge-Martingrove-Richview (7)</td>
<td>North Etobicoke Malton West Woodbridge &amp; North York West</td>
<td>North Etobicoke Malton</td>
</tr>
<tr>
<td></td>
<td></td>
<td>West Woodbridge</td>
</tr>
<tr>
<td>Islington-City Centre West (14)</td>
<td>South Etobicoke &amp; West Toronto</td>
<td>South Etobicoke</td>
</tr>
<tr>
<td>Victoria Village (43)</td>
<td>North York Central &amp; East Toronto</td>
<td>East Toronto</td>
</tr>
<tr>
<td>Leaside-Bennington (56)</td>
<td>North Toronto &amp; Mid-East Toronto</td>
<td>North Toronto</td>
</tr>
<tr>
<td>South Riverdale (70)</td>
<td>Mid-East Toronto &amp; East Toronto</td>
<td>East Toronto</td>
</tr>
<tr>
<td>Waterfront Communities-The Island</td>
<td>Mid-West Toronto &amp; Mid-East Toronto</td>
<td>Mid-East Toronto</td>
</tr>
<tr>
<td>(77)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yonge-St.Claire (97)</td>
<td>Mid-West Toronto &amp; North Toronto</td>
<td>North Toronto</td>
</tr>
<tr>
<td>Clairlea-Birchmount (120)</td>
<td>East Toronto &amp; Scarborough South</td>
<td>East Toronto</td>
</tr>
<tr>
<td>Birchcliffe-Cliffside (122)</td>
<td>East Toronto &amp; Scarborough South</td>
<td>East Toronto</td>
</tr>
</tbody>
</table>

Sub-Region boundaries do not equate to Ontario Health Team (OHT) boundaries, but are used as a proxy to show the approximate catchment area served by OHTs.

Unmet need is currently not accounted for in the estimate of Service Requirements. A process to define quantitative estimates of unmet need through engagement with local stakeholders is in development for operationalization during the next phase of planning.

Estimates of service capacity for physicians are in visits, while estimates of service capacity for allied health providers are in hours per week.

The information in the HPDB was provided on an "as-is" basis. The data were originally obtained by the Ministry of Health directly from health regulatory Colleges. The Ministry therefore cannot and does not warrant or represent that the information is accurate, complete, reliable or current.

Spatial patterns of utilization and the primary care workforce are not independent; there is an interaction and observed patterns can change over time. For more information about the neighbourhood- and sub-region-level spatial patterns of utilization methodology, results, and visualizations, please contact Ontario Health Toronto.

Due to the data lags associated with the use of administrative data for planning, the most recent year of data input into this planning exercise is for FY 2018/19 and trends that have since emerged are not reflected in our analysis.

Our workforce model projects forward current capacity available within the system and does not model the impact of entry of new health care providers into the workforce. The neighbourhood-level gaps between service capacity and service requirements illustrated in our outputs can be used to identify neighbourhoods where additional resources are required to meet primary care needs.

Abbreviations

ACSC – Ambulatory Care Sensitive Condition
AHRQ – Applied Health Research Question
CIHI – Canadian Institute for Health Information
COPD – Chronic Obstructive Pulmonary Disease
ED – Emergency Department
FY – Fiscal Year
NP – Nurse Practitioner
OCHPP – Ontario Community Health Profiles Partnership
OHT – Ontario Health Teams
OT – Occupational Therapist
PEM – Patient Enrolment Model
PT – Physiotherapist
RN – Registered Nurse
RPN – Registered Practical Nurse
RT – Respiratory Therapist
SLP – Speech & Language Pathologist

Contact

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