



SCIENCE BRIEFS

Brief on Primary Care Part 3: Lessons Learned for Strengthened Primary Care in the Next Phase of the COVID-19 Pandemic

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About Us: The Ontario COVID-19 Science Advisory Table is a group of scientific experts and health system leaders who evaluate and report on emerging evidence relevant to the COVID-19 pandemic, to inform Ontario's response. The Science Advisory Table's mandate is to provide summaries of relevant scientific evidence to public health and health care professionals, as well as the general public, by integrating information from existing scientific tables, Ontario's universities and agencies, and the best global evidence. The Science Advisory Table is hosted by Public Health Ontario (PHO). Aligned with PHO's mandate, the Science Advisory Table provides credible and independent scientific and technical advice to inform government and the broader public about COVID-19 and to help prepare for and respond to future public health emergencies.

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Key Message

It is anticipated that future waves of COVID-19 infections and sequelae of prior infections will continue to strain primary care resources in Ontario. This Brief, the final part of a 3-part series, consolidates five lessons learned to date based on the evidence presented in [parts 1](#) and [2](#) of this Science Brief:

Lesson 1: Care provided in formal attachment relationships and through team-based models provides superior support for COVID-19- and non-COVID-19-health issues in the community.

Lesson 2: In the absence of additional resources, COVID-19 response results in trade-offs and unmet needs in other areas.

Lesson 3: Innovative models and new partnerships supported patients, particularly those from equity-deserving groups, to get needed care, but infrastructure is needed for sustainability, spread, and scale.

Lesson 4: The absence of an integrated and inclusive data system compromised the pandemic response in primary care.

Lesson 5: Primary care can leverage its longitudinal relationships to improve population health and health system sustainability.

Heeding these five lessons would strengthen and support the primary care sector in Ontario to meet expected challenges in pandemic response and recovery.

Summary

Background

Ontario's primary care clinicians have played a central role in pandemic response and care delivery. Equitable access to primary care that is continuous, coordinated, accessible, culturally safe, and comprehensive is necessary to ensure that Ontarians receive high-quality health care services within an effective, efficient, and equitable health system. This Brief, the final part of a 3-part series, consolidates five lessons learned to date based on the evidence presented in [parts 1](#) and [2](#) of the Science Brief on primary care.

Questions

What are the lessons learned with respect to primary care for the next phase of the pandemic?

What are short- and longer-term recommendations informed by these lessons?

The views and findings expressed in this Science Brief are those of the authors and do not necessarily reflect the views of all of the members of the Ontario COVID-19 Science Advisory Table, its Working Groups, and its partners.

Findings

We summarized five lessons learned to date during the pandemic:

Lesson 1: Care provided in formal attachment relationships and through team-based models provides superior support for COVID-19- and non-COVID-19-health issues in the community.

Lesson 2: In the absence of additional resources, COVID-19 response results in trade-offs and unmet needs in other areas.

Lesson 3: Innovative models and new partnerships supported patients, particularly patients from equity-deserving groups, to get needed care, but infrastructure is needed for sustainability, spread, and scale.

Lesson 4: The absence of an integrated and inclusive data system compromised the pandemic response in primary care.

Lesson 5: Primary care can leverage its longitudinal relationships to improve population health and health system sustainability.

From these, we developed a series of short and longer-term recommendations. These recommendations outline ways to support the goal of every Ontarian being able to equitably access COVID-19 and non-COVID-19-related primary care that is continuous, coordinated, and comprehensive throughout future pandemic waves and health system recovery.

Interpretation

Investments are needed to increase the number of Ontarians formally attached to a primary care clinician supported by a primary care team. Teams should be supported regionally through partnerships with local public health, community health, and social services to improve both equity and integration of care. Enhanced data systems would allow these teams to respond better to emerging crises. Such investments, if coupled with accountability frameworks, would be expected to improve equitable access to continuous, comprehensive, culturally safe, and coordinated care and mitigate trade-offs or unintended consequences during the current pandemic recovery and beyond.

Background

Ontario faces a significant challenge in keeping up with demand for high-quality primary care services, which are a necessary foundation for a high-performing health system. Many Ontarians are already unable to access equitable, comprehensive and continuous primary health care, and that number is growing.¹

It is anticipated that the primary care sector will continue to play an important role in delivering COVID-19-related care, including prevention through vaccination as well as treatment of COVID-19 infections and long-term sequelae. Primary care clinicians (PCCs) played integral (but variable) roles in the pandemic response in Ontario; a reduction in some important primary care services also occurred during this time.² A backlog of deferred and delayed care in hospitals, diagnostics, and specialty care due to the pandemic adds to current pressures on the primary care sector. Here we consolidate lessons learned building upon the evidence summarized in parts 1 and 2 of this 3-part Science Brief and offer a series of immediate- and longer-term recommendations to support the primary care sector and the patients it serves as the health system continues to respond and recover from the COVID-19 pandemic.

Questions

What are the lessons learned with respect to primary care for the next phase of the pandemic?

What are short- and longer-term recommendations informed by these lessons?

Findings

This Brief is the third and final part of a Science Brief focused on primary care. It builds on the analyses completed for the preceding parts, entitled “The roles of primary care clinicians and practices in the first two years of the COVID-19 pandemic in Ontario” and “Factors Affecting Primary Care Capacity for Response and Recovery”.^{2,3} The evidence from parts 1 and 2 was supplemented by additional literature reviews and an environmental scan to identify best practices that might be transferable to the Ontario context. The authors of parts 1 and 2 collaborated to develop the key lessons learned and relevant recommendations. This involved an iterative process of considering common themes (e.g., lessons learned) from the analyses and mapping those themes to potential actions. These lessons learned and recommendations were then discussed with additional experts and peer-reviewed through the Ontario COVID-19 Science Advisory Table.

In drawing these lessons and associated recommendations, particular attention has been paid to the international literature demonstrating that high-performing health systems feature a primary care sector that reliably delivers the “Four Cs”: First Contact with the system; Continuity; Comprehensiveness, and Coordination. A more in-depth exploration of the evidence and data behind each lesson and recommendation is offered in parts 1 and 2 of the Science Brief.

Lesson 1: Care Provided in Formal Attachment Relationships and through Team-Based Models Provides Superior Support for COVID-19 and Non-COVID-19 Health Issues in the Community

During the COVID-19 pandemic, patients who had a formal and continuous relationship with a PCC had better access to virtual and in-person care.⁴⁻⁶ However, as described in parts 1 and 2 of this Brief, access to such care is inequitably distributed in Ontario, such that equity gaps were worsened during the pandemic. Specifically, formal attachment to a PCC was a key determinant of being able to continue to access care, and team-based PCCs were more fully able to participate in a wide range of pandemic-response activities.

The ability to adapt to the emerging pandemic response needs while continuing to deliver regular primary care was demonstrated as teams rapidly shifted, redeployed, and innovated in their roles.⁷ The value of primary care teams in responding to the pandemic was described by the Organisation for Economic Co-operation and Development (OECD) as the capacity of teams to re-organize tasks and services to respond to community needs, often through leveraging digital tools and/or linking with community services.⁸

In contrast with solo PCCs, multidisciplinary, team-based primary care practices (e.g., with multiple family physicians and/or nurse practitioners working along with interprofessional colleagues in nursing, pharmacy, social work, community health and other disciplines within primary care) were better able to support integration with other parts of the health system as well as community organizations. For example, they had greater capacity to participate in community-led initiatives and to develop close relationships with hospitals, public health units, and other partners to access infection prevention and control (IPAC) expertise and personal protective equipment (PPE) to support safe care in the office setting, as well as to access specialist advice and services.⁹ COVID@Home¹⁰⁻¹² programs were more likely to be implemented in team-based settings. Primary care teams were also more likely to engage in outreach to equity-deserving communities disproportionately affected by the pandemic. For instance, the Black Creek Community Health Centre (CHC) in northwest Toronto

engaged community ambassadors and organized vaccine clinics during evenings and weekends to accommodate essential workers, contributing to a significant increase in vaccine uptake, from 5.5% in April 2021 to 56.3% in May 2021.¹³

Ontario needs more PCCs, including family physicians, nurse practitioners, physician assistants, primary care nurses, pharmacists, and other primary care clinicians.³ It especially needs more clinicians from First Nations, Inuit and Metis (FNIM) communities¹⁴ as well as racialized and other equity-deserving groups to meet the needs of the population.¹⁵ However, training and supporting such growth will take time, particularly in the case of family physicians. Further, it is not known whether a reservoir of potential primary care nurse practitioners might exist in Ontario or if their recruitment to primary care could reduce capacity in another health system sector. Many nurses left the profession during the pandemic. Through a combination of intrinsic (i.e., increased autonomy) and extrinsic (financial) motivators, perhaps many could be incentivized to return; providing them with training as needed to contribute as part of primary care teams could be one path forward for increasing capacity to increase access to care.¹⁶ Expansion of physician assistant training programs might also help in this regard,¹⁷ and may be an appropriate career path for some groups of internationally-trained health professionals.¹⁸

In light of the experiences summarized above, and given the ongoing and impending health human resource (HHR) challenges outlined in part 2 of this Science Brief, it will be necessary to maximize the use of a much wider potential range of health workers in primary care. Supporting clinicians to work at “top of scope”, which means performing tasks that are high yield and cannot be substituted by other members of the team, is important.

To optimize resources in primary care, there will be a need to consider ways of building a support structure within teams to enable them to complete more tasks for more people. Creative approaches such as task shifting are needed in primary care teams to preserve skilled professionals for work in which their higher skills are needed.¹⁹ For example, non-clinical staff in primary care settings could be used to both reduce administrative burden on PCCs,²⁰ and support care reconnection due to pandemic disruptions.²¹ Further, community-embedded workers (such as community ambassadors and community health workers) can support culturally safe practices and/or address social needs that impact health;²² other roles such as health promoters/health prevention practitioners can build on pandemic outreach strategies.²³ Evidence suggests potential cost-effectiveness of these new roles in primary care delivery.¹⁹ However, further study is needed in Ontario, as these creative approaches to staffing are likely best suited to models in which care can be meaningfully aligned with the needs of the community, and managed through rostering or attachment to primary care teams. Community engagement in developing expanded primary care teams might be fruitful.^{24,25} Policies to hasten entry for internationally trained health care workers into new roles such as these (with appropriate training and supports, including cultural sensitivity and safety) represent a useful start toward addressing these issues.^{24–26} Approaches that interpret “team” more loosely, allowing for virtual support across geographic networks, can improve integration and continuity of care.^{27,28}

Given current HHR constraints, universal attachment to individual PCCs without substantial changes to the practice environment is not possible.¹ Instead, based on strong evidence from other jurisdictions, universal attachment to team-based primary care in Ontario (featuring nurse practitioners, physician assistants, and other health professionals) should be the goal.^{29,30} The evidence supports a strategy that allows patient attachment to both a local team and a designated most responsible clinician within the team. The ability of Ontario’s health system to respond to upcoming waves of COVID-19 and to address pandemic-associated backlogs of non-COVID-19 care requires such an approach.

Lesson 2: In the Absence of Additional Resources, COVID-19 Response Results in Trade-Offs and Unmet Needs in Other Areas

Trade-offs happen when demands rise, but resources stay the same. Around the world, governments and health systems appropriately diverted resources into COVID-19-response. The resulting challenges across the rest of the health care system – delayed surgeries,^{31,32} cancelled diagnostic imaging, deferred screening,³ and suboptimal management of chronic disease² – are predictable outcomes of the choices made under tremendous pressure.³³ The need to reallocate resources to the COVID-19 response meant that non-COVID-19 services, many of which were time-dependent and essential, were deferred or delayed.

The primary care workforce actively supported multiple phases of the pandemic response in collaboration with local public health units. This included COVID-19 assessment and testing, mass vaccination, COVID@Home initiatives, care delivery in field hospitals and hospital settings, all while continuing to provide routine primary care. Funding incentives to deliver COVID-19-related clinical work and requests to support pandemic response helped to mobilize PCCs, but likely resulted in some PCCs choosing pandemic response work over starting new practices or providing locum coverage. Practicing PCCs may also have reduced their regular practice to respond to the call to participate in pandemic response work.

The need for primary care response to COVID-19 is ongoing. However, it seems likely that most COVID-19 will be diagnosed and managed in PCCs for the foreseeable future, assuming that both vaccination rates remain high in Ontario and vaccines continue to be effective against severe illness and hospitalization across all age groups.

The current Ontario Health (OH) stated priorities³⁴ for primary care are:

- Continue to focus on urgent and emergent care to avoid unnecessary emergency department visits
- Undertake early identification and referral of patients who would benefit from COVID-19 therapeutics and remote monitoring of patients with COVID-19
- Resume or continue preventative care (e.g., cancer screening) and chronic disease management
- Continue to support COVID-19 vaccination

Notably, there is no list of activities to de-prioritize. The primary care sector, like hospitals and public health units, is being faced with difficult decisions between competing priorities that have grown in scope and scale during the pandemic. The kinds of resources required to support comprehensive primary care services are not strictly financial; human resources are required to support an expansion and improvement of the role of primary care. Much of the work of identification, referral, monitoring, outreach, communication, and population health management should be supported by non-clinical team members.³⁵ Ontario Health Teams (OHTs) may be positioned to provide regional support.

Lesson 3: Innovative Models and New Partnerships Supported Patients, Particularly Patients from Equity-Deserving Groups, to Get Needed Care, but Infrastructure Is Needed for Sustainability, Spread, and Scale

Remote home monitoring programs and virtual models of COVID-19 care within comprehensive primary care were highly successful in Ontario for those who were able to access them, and new relationships were built to support an expanded “Patient Medical Home”³⁶ to include medical, social, and community supports to integrate community-based health care and social services. These successful innovations could be further nurtured through the infrastructure of OHTs.

While virtual care can improve access to care for some people (e.g., those with

mobility issues, rural or remote dwellings, or having restricted schedules), it can reduce it for those who do not have access to the appropriate technology, data plans, or ability to use virtual care tools.³⁷ It may also exacerbate barriers to cultural safety, including lack of trust,³⁸ language and cultural barriers and may not be in line with expressed preferences of structurally marginalized populations for in-person care.^{39,40} In-person primary care has strong evidence for improved population outcomes.³⁰ Evidence for virtual care is variable at present but rapidly growing, with stronger evidence demonstrating the value for some clinical encounters that do not require in-person examination.² However, there is emerging evidence for potential harm when virtual care is uncoupled from in-person care entirely (as in the case of virtual walk-in clinics).⁴¹ Evidence-informed recommendations are needed to guide PCCs on how to decide whether care should be delivered in person or virtually, and efforts will be needed to support implementation of such guidance so that patients do not face inappropriate variation in the types of care offered.

Relationships between hospitals, Public Health Units (PHUs), primary care teams and community organizations expanded in many communities during the pandemic, potentially accelerating conversations about care integration. For example, in Ottawa, the Kids Come First OHT (kidscomefirst.ca) and the Children's Hospital of Eastern Ontario (CHEO) worked with the primary care sector, including family doctors and pediatricians. This collaboration led to the opening of a COVID-19 Care Clinic for children and youth and facilitated access to self-administered COVID-19 tests for community primary care practices.

Collaboration between health and social services also expanded across many regions with community health workers, health ambassadors and community agencies as key players leading partnerships with primary care in COVID-19 vaccination. Examples of such collaboration between primary care and other parts of the health and social sectors include the Under One Roof initiative, a partnership of seven health and social services agencies from the East York Region North Durham OHT with the goal of understanding the health needs of older adults from East Asian and South Asian communities. This project co-designed solutions to improving equitable, culturally-relevant and accessible primary care for older adults.²² The Black Vaccine Engagement Team, a consortium of ten Black-community serving agencies, came together in April 2021 to encourage the open, culturally-responsive, and non-judgmental engagement and education of Black residents from across Toronto around COVID-19 and vaccinations. One of those agencies, TAIBU CHC, also provided regular vaccine clinics for the Black Community and continues to do so.⁴²

In many FNIM communities, self-governing and self-organizing community models were highly successful.⁴³ Operation Remote Immunity was a vaccination effort launched in February 2021 and was a collaborative effort between the Nishnawbe Aski Nation; the Ministries of Health, Indigenous Affairs, Solicitor General and Natural Resources and Forestry; federal government partners and Ornge. This team delivered COVID-19 vaccines to 31 remote fly-in FNIM communities and Moosonee, and demonstrated the essential role of FNIM leadership and a community-based approach with FNIM communities.⁴⁴ In total, over 42,000 vaccine doses were administered through Operation Remote Immunity. In Toronto, the mobile testing clinic run by Anishnawbe Health Toronto and the Auduzhe Mino Nesewinong comprehensive COVID-19 response clinic and outreach program were successful in mitigating barriers to accessing care using a “by community, for community” approach.⁴⁵ As another example, FNIM midwives played a leading role in responding to the unmet health and public health needs of the 88,000 FNIM people living in the city of Toronto during COVID-19. Further, in addition to policy advocacy, the Indigenous Primary Health Care Council⁴⁶ took a leadership role in developing resources and training multiple service organizations regarding cultural safety related to COVID-19 and COVID-19 vaccination,

including creating a toolkit to provide guidance on engagement strategies for vaccine implementation for FNIM people in Ontario. These Indigenous-specific services are hypothesized to have contributed to the higher rate of COVID-19 testing among FNIM individuals compared to general Toronto populations prior to changes introduced to COVID-19 testing during the Omicron wave.⁴⁵

Whether through OHTs or innovative approaches in high-priority communities that cross geographic boundaries, ongoing commitment to such partnered approaches that include PCCs as an essential element will be necessary. Collaborations across silos in the health and social systems arose out of commitment to community response, but to sustain or to scale and spread such initiatives, they will require infrastructure and resources.

Lesson 4: The Absence of an Integrated and Inclusive Data System Compromised the Pandemic Response in Primary Care

A complete picture of primary care does not exist in Ontario's data sets. Important aspects of care are not included, such as care provided by non-physicians, leading to a dearth of data about the roles of nurse practitioners, nurses, pharmacists, social workers and other PCCs. Furthermore, patient-level sociodemographic details (e.g., race, ethnicity, immigration status) are often missing and important populations are typically excluded altogether, and can include groups such as FNIM peoples,⁴⁷ homeless or underhoused populations, refugees, and undocumented individuals. This disjointed and non-comprehensive data system means that health system leaders cannot measure what PCCs or teams are doing, who they are serving, and the effectiveness of that care. This makes it difficult to identify gaps in care or disparities in health outcomes and quality of care requiring action. Ideally, such data could have informed prioritized allocation of a variety of pandemic-related supports and materials, such as proactively providing PPE to clinics serving high-risk populations. Later in the pandemic, data limitations also meant that only a subset of primary care practices and clinicians could receive reports identifying their unvaccinated patients.⁴⁸

The experience of the COVID-19 vaccine rollout showed that when timely data were made available, many primary care teams, community organizations, and PHUs were able to band together with other system players in a data-driven, equity-focused response, as was the case in high-priority communities.⁴⁹ Data collection, governance, oversight, and use for equity-oriented system response, quality improvement and research should be strengthened. Sociodemographic data should be collected in a standardized way in primary care settings and elsewhere in the community, building on the latest evidence on the collection, analysis and use of such data.⁵⁰⁻⁵³ A dearth of accurate and culturally safe data collection for FNIM peoples in health service and public health data systems highlights the need for engagement of FNIM leadership in the governance and management of such data.⁵⁴

The scope and potential utility of Ontario's health data infrastructure (including, but not limited to, the linked administrative databases held at ICES) could be strengthened through inclusion and linkage of more comprehensive data capturing activities and services in primary care. A future approach could build on POPLAR (Primary care Ontario Practice-based Learning and Research Network). POPLAR is an initiative of Ontario's six University Departments / Sections of Family Medicine and the Alliance for Healthier Communities. POPLAR collects electronic medical record (EMR) data to support practices in delivering optimal care across Ontario, strengthen primary care research, and facilitate quality improvement processes. Currently, POPLAR has over 1000 family physicians and nurse practitioners for over 1.5 million patients and is anticipated to double in size (Michelle Greiver, personal communication) over the next 3-5 years.⁵⁵ Supporting initiatives such as POPLAR to capture routinely updated primary care data that can be used by health system leaders, as well as research and

PCPs for quality improvement, could identify high-needs populations and track care deficits during pandemic response and recovery. Such an approach aligns with the call from the Lancet Commission to invest in infrastructure to support implementation of high-quality primary care.²⁹

Data from primary care can serve as a critical component of a provincial data platform that integrates multiple sources to identify health care disparities and gaps in care. Ideally, this platform would include all community-health service use and prescription medication dispensing data (regardless of payer), and it would be accessible for the identification of local challenges and evaluation of local solutions. Such a platform could allow tailored responses that can then be monitored and evaluate novel approaches to improving primary care.⁴⁸ As an example, primary care researchers are testing the use of artificial intelligence in automating the processing of this data to better identify emerging novel pathogens that could drive the next pandemic.⁵⁶

In summary, population-based approaches to data analytics can inform the primary care and health system response to future pandemic waves.⁴⁸ This will also be essential to identifying inequities and gaps in care for targeting future interventions, including the rollout of team-based models of primary care in preparation for future public health emergencies. Appropriate oversight of relevant metrics should be used to allocate resources and evaluate the subsequent response – such approaches require data.

Lesson 5: Primary Care Can Leverage Its Longitudinal Relationships to Improve Population Health and Health System Sustainability

PCCs can play a role in local outreach to build vaccine confidence⁴³ and are a key resource for messaging to the public about what to expect and how to navigate the health care system as the pandemic progresses. For example, on social media, family physician-led initiatives such as PandemicPregnancyGuide (40,000 Instagram followers) and CovidVaccineFacts (5,500 Instagram followers) both gained substantial traction. Many Ontario COVID-19 Science Advisory Table briefs included PCC authors; 94 of 114 briefs had primary care authors; 17 of the 20 most-viewed briefs and 19 of the 20 most-downloaded briefs featured primary care authors. These data suggest a substantial appetite for public-facing communications involving or led by PCCs, reflecting the high levels of trust that people place in their PCC, especially in the context of long-standing relationships.² The potential influence of PCCs on population health may be amplified if partnerships are deepened with trusted community-based service providers to reach populations where higher levels of mistrust in the health care system exist due to a range of factors, including historic, contemporary, and systemic discrimination.

The credibility earned through these trusting relationships can be leveraged for COVID-19 recovery and future health system crises through mass communications, but also to effectively address public health priorities one patient or one family at a time in the clinic. For example, there are evidence-based approaches that PCCs can follow to effectively provide vaccine advice;^{57,58} the same is true of advice across a wide range of other health and health system topics.⁵⁹ For example, specific communication techniques can lead to improved appropriateness of antibiotic prescribing.⁶⁰

There are substantial and inappropriate variations in the quality of primary care delivered in Ontario both for COVID-19 and non-COVID-19 related issues. Such variations threaten health system sustainability (e.g., when patients are offered low-value care)⁶¹ and exacerbate health-related inequities (e.g., if certain populations have less access to high-quality care than others). Commitment from PCCs to address these gaps, and accountability for doing so, should be built into expectations from professional colleges and associations with the appropriate supports. Research shows that primary care would benefit from support to implement best practices more

reliably.⁶² Implementation gaps in primary care are usually due to more than just lack of knowledge;⁶³ addressing these gaps can be difficult due to the distributed nature of the sector and payment models that incentivize brief, single-issue appointments. In addition to structural changes needed to facilitate more Patient Medical Homes, active implementation strategies such as audit and feedback,⁶⁴ practice facilitation,⁶⁵ and academic detailing⁶⁶ initiatives targeting the range of relevant barriers are needed.^{67,68}

One major challenge during the pandemic was finding a way for all members of the primary care sector to “read from the same script”.² A shared source of trusted information is needed to prevent different PCCs from delivering different messages. The Centre for Effective Practice helped bridge this gap by partnering with primary care associations and the government to produce a rapidly updated, central, credible source of information; their website garners over 130,000 unique visitors annually (David Price, personal communication). Such information would be more likely to lead to desired action in the context of sustainable infrastructure to actively deliver primary-care-oriented information tailored to the needs of different PCCs and the various communities in which they work. However, up-to-date contact information for primary care clinics and clinicians and data systems for targeting messages (e.g., based on [prevalence](#) of illness or gaps in care) is still not available to regional health system leaders tasked with developing primary care-oriented messages and implementation strategies.

Fortunately, when primary care came together as a sector to learn, exchange information, link to other parts of the health system and educate the public, effective knowledge translation work occurred in Ontario.³ These experiences could be leveraged for future waves and for supporting primary care to manage other health system priorities for which evidence is rapidly changing.

Recommendations to Strengthen Primary Care in Pandemic Response and Recovery

High-quality primary care is built on the “Four Cs”:⁶⁹ first-Contact accessibility; Continuity of care (featuring longitudinal relationships with teams and a most-responsible clinician); Comprehensiveness (including proactive prevention and chronic disease management along with reactive care for more acute issues), and active Coordination of care (through integration with a range of specialty health and social services). In the current Ontario context, coordination requires work both internal to the primary care sector as well as work to integrate primary care with other parts of the health system. Since the pandemic affected each of these core functions of primary care in various ways, we present evidence-informed recommendations based on the lessons learned, organized into three themes that align with these functions. These recommendations represent the expert opinion of the authorship team but are drawn directly from the evidence presented in detail in parts 1 and 2 of this Science Brief and summarized in the lessons learned described above.

1. Ensure Everyone Has the Opportunity for Continuity of Care with a Primary Care Clinician, Supported by a Team, for Routine COVID-19 and Non-COVID-19 Health Concerns

COVID-19 response and recovery will be aided by an increase in the number of Ontarians formally attached to primary care and this must be pursued even as the traditional workforce contracts. This will only be possible through advancing team-based primary care, which should take place in the context of clear expectations and accountability for access, equity, and continuity at the team and individual level.

Immediate Recommendations to Address Access and Continuity

A plan must be developed to expand team-based resources with a view to improving access to primary care teams for more Ontarians. Investments should be accompanied

by clear expectations for impact on access and equity as measured through ongoing evaluations. This should start with teams and clinicians who are prepared to serve historically and/or currently under-served and under-resourced populations. Mental health workers, pharmacists, nurses, and other interprofessional team members are particularly critical to address population needs for mental health services and care, ongoing vaccination efforts and COVID-19 treatments, and triage and care of sick patients, respectively. To address HHR challenges in rural areas, team members capable of supporting PCCs virtually might be recruited to work remotely if necessary. Policies to ensure that virtual care services offer not only access, but also continuity, are needed. Likewise, the introduction of prescribing for minor ailments by Ontario community pharmacists should improve access to care, but effects on continuity, comprehensiveness, and integration of care must be evaluated.

Longer-Term Recommendations to Address Access and Continuity

Continued expansion of capitation and/or salaried models should be explored, with a priority on communities with greatest gaps between service capacity and need. Appropriate accountabilities will be needed, as well as ongoing evaluations to help determine the most efficient ways to achieve health system goals. Although PCCs working in fee-for-service models are incentivized to maximize throughput (i.e., access), purely fee-for-service models were associated with worse continuity and lower achievement in other health system quality indicators (including COVID-19 vaccine uptake) during the COVID-19 pandemic.²

Since HHR challenges will require a long time horizon to fully address, creative approaches to task shifting and sharing will be necessary.¹⁹ More regulated health professionals, such as nurse practitioners, nurses, pharmacists, mental health workers, and physician assistants with expertise in primary care, will be needed. In addition, creative approaches to team extension across geography will be necessary. Borrowing from lessons learned in contexts with long-standing HHR challenges, regulated team members could be coupled with specific funding for primary care teams to work with non-regulated health workers. This might include personnel who can assist with administrative burden or community health workers and ambassadors who can do outreach to marginalized groups. Such innovations would be facilitated by regulatory reviews and central oversight. Spread and scale of such models should be dependent on results of evaluations that consider their range of potential benefits against costs.

2. Ensure Primary Care Can Facilitate Coordination and Integration of Care for Patients in the Era of COVID-19 System Recovery through Formal Regional Networks

Especially in times of rapid change, awareness of new evidence to be applied and/or new services being made available becomes critical. Patients rely on their primary care team to provide evidence-informed advice, connect them with the health and social care services they need, and ensure that such connections will be both expeditious and helpful. They expect that their primary care team will be made aware of all health system encounters. Likewise, hospital and social sectors also need appropriate information and support from primary care to do their work effectively.

Immediate Recommendations to Address Coordination and Integration

A cornerstone of pandemic management is communication. It is currently impossible for regional health leaders to connect with all local PCCs or even primary care clinic leaders. To address this, physician email addresses and other contact information and practice data shared with the College of Physicians and Surgeons of Ontario (CPSO) (and equivalents across other professions) should be provided to key health service and public health organizations to be used for coordinating regional health efforts. Each PCC and primary care team should have a secure email address for such communications.

Since coordinated care requires clear communication, primary care should be represented at relevant regional and provincial pandemic planning tables, especially those related to COVID-19 testing, vaccination, and treatment. This could include the involvement of primary care by PHUs in community-based pandemic work, and in hospital-led and OHT-led community-based initiatives. At the provincial level, The Primary Care Advisory Table to the Minister of Health, made up of PCCs from across the province, allowed a new mechanism for sharing information about issues in primary care, as well as a direct voice into the Ministry for issues affecting primary care (David Price, personal communication). This should be continued, but representation at multiple levels creates relationships that help with health care system integration.

A centralized, provincial resource to produce unified educational materials for patients and the public that are updated in a timely way, ideally available on a single central website, is needed. This should include lay handouts as well as other media translated into multiple languages. The same source could be used to present unified guidance to PCCs, possibly adapted for each region when necessary. For example, guidance on the approach to respiratory viruses in the fall and winter seasons (specific to each region) would help both clinicians and the public to know how to respond to symptoms of viral illness during ongoing pandemic surges. To improve buy-in and ensure potential implementation issues are identified and addressed, PCCs should be involved in the development and dissemination of such guidance and in surge planning at the OHT, OH-region, and provincial levels. Where possible, new processes at the system level related to COVID-19 testing, treatment, and vaccination, as well as respiratory illness management, should be integrated into existing primary care pathways and relevant change management should be thoughtfully considered. Active implementation strategies and continued support for provincial and regional communities of practice are needed to supplement more passive dissemination of information.

Since backlogs for specialist appointments create additional burden on primary care and stress for patients, enhanced implementation supports for e-consult, e-referral, and other local solutions that enhance access to specialty care in an organized manner are critical. Evidence-based initiatives to reduce wait times, such as centralized intake and triage for specialist appointments at the regional or provincial level, should be pursued.⁷⁰

PCCs will need to commit to reliably implement appropriate pathways to respond to regional health system needs or public health crises. This may involve deferring some preventive services that are less time-sensitive during certain times of the year, following regional guidance for infectious disease management, adjusting access to care in response to community needs, and/or implementing processes to ensure that local patients can access evidence-based investigations and treatments.

Longer-Term Recommendations to Address Coordination and Integration

Hospitals, clinics, and PCCs should continue to build stronger links in their regions, either directly, or through the local OHT, or both. Links between hospital and primary care should be extended to include social services to reach typically excluded groups in each region. Bilateral relationships have been useful and important during the pandemic and could be used in future waves to ensure appropriate access to PPE and IPAC advice in primary care, as well as appropriate community-based testing and treatment for COVID-19 as well as the annual fall respiratory illnesses surge. These collaborations can also support regional solutions to COVID-19-related backlogs, facilitating access to care for patients transitioning from hospital to community and vice-versa by scaling integration of care initiatives such as Seamless Care Optimizing the Patient Experience (SCOPE).⁷¹ Compared to clinicians working in hospitals, PCCs have fewer funding sources for leadership roles; this may need to be addressed in the longer term to facilitate integration efforts.

A provincial knowledge infrastructure represents the foundational underpinning for equitable implementation of high-quality care. Such infrastructure should include centrally produced, evidence-based knowledge translation initiatives so that patients receive consistent messages, regardless of where or how they access primary care. Population-specific experts would be needed to help adapt core messaging into local languages and contexts. Data should be used to identify clinics where increased supports may be necessary to meet patient needs (e.g., where support for quality improvement initiatives may be most beneficial). Finally, the knowledge infrastructure should enable a set of data-driven, clinician-informed, and equity-oriented HHR plans for primary care. Such plans should support a wide-ranging set of goals that support not only pandemic response, but longer-term population health needs, such as:

- Consideration of expansion of non-physician roles, including training more nurse practitioners and physician assistants
- Identifying evidence-informed ways to encourage new PCC graduates to enter comprehensive practice and current PCCs to stay in practice
- Identifying appropriate accountability levers to ensure all PCCs are able to use any additional resources to provide care for a greater number of patients.

Most solutions will require support for training, infrastructure, and team expansion, as well as clear links to improved service delivery outcomes as a result of investments.

Data collection and governance in primary care require attention. Collection of sociodemographic data is critical to ensure that the ongoing pandemic response, as well as all other primary care services, are informed by an equity lens. Improving the integration of provincial data systems between public health, Ontario Health, primary care practices, and community pharmacies would facilitate a more integrated response to future crises and support research that evaluates what works and what does not work in the primary care system. This includes changes to EMR standards to ensure data can be collected and used. The eventual goal should be interoperability so that there is one digital health record for each patient, as is now being pursued in the European Union.⁷² Data governance that is culturally safe and collection processes that are responsive to the complexity of data collection about race, ethnicity and FNIM identity will be required to ensure that this work addresses, rather than deepens, inequities.⁴⁷

Data systems are currently available in Ontario that could be used to support primary care health services research and enable audit and feedback of vaccination data (and other quality of care metrics) to every PCC, regardless of model.⁷³ Rostering each Ontarian to a PCC or practice would make feedback of such quality metrics more feasible, accurate, and actionable because it would be more clear who is most responsible for a person's care. Going forward, PCCs and primary care practices should contribute to provincial data holdings and all primary care clinicians should be provided with information using such data about their practice to inform ongoing quality improvement efforts. Local primary care leads, with oversight from provincial stakeholders, should be responsible for monitoring and supporting quality in community-based practices. Local leaders are also best equipped to recognize and respond to the complexities involved in gathering high-quality sociodemographic data in a manner that contributes to, rather than undermines, cultural safety.

3. Ensure That Primary Care Is Comprehensive

The core tenet of comprehensive primary care is not for any individual clinician to do everything, every time, but for a team to provide a range of relevant services to a defined population.⁷⁴ Primary care should be supported to enable this approach as the pandemic transitions to an endemic phase. COVID-19-related work can take its place alongside the other aspects of work done daily in primary care across Ontario.

Achieving this goal will require teams that allow for cross-coverage during time off or when a clinician is serving the community outside the primary care office setting. This will require an ongoing commitment from primary care teams to quality improvement (e.g., to do more and to do it better), with adequate health system support, including data and personnel. As teams become larger, additional attention to ensuring continuity of relationships will be needed, especially for patients with medical and social complexity.

Immediate Recommendations to Address Comprehensiveness

Comprehensive primary care in Ontario has always included counselling about and provision of routine immunizations. As mass immunization clinics and other large-scale COVID-19 response requirements wind down, efforts are needed to facilitate opportunistic vaccination in primary care offices. If COVaxON continues to be the provincial vaccination system, then it is important to address barriers to use in primary care, such as burdensome data entry requirements and lack of integration into primary care electronic records. One potential option to overcome existing barriers is to allow primary care practices to submit immunization data to be centrally entered into COVaxON. Ideally, all vaccine databases should be integrated and access provided through ONE-ID to enable primary care clinicians and teams to use such data easily for their patients. Another option is to address the unintended consequences of current compensation for COVID-19 assessment and vaccination centres, and instead to support the integration of COVID-19 clinical management into comprehensive office-based primary care.

Longer-Term Recommendations to Address Comprehensiveness

While virtual care has been helpful in sustaining relationships between patients and primary care team members, it can detract from the goal of comprehensive primary care when delivered through services that are decoupled from a primary care team providing longitudinal care.⁷⁵ Clear guidance to PCCs and the public about where virtual care should (and should not) be used is needed. Policies that ensure adequate and equitable access to in-person care for populations and conditions that require it are needed, and professional colleges should provide clear guidance and policies informed by evaluations of local data to understand how best to balance access and quality of care.

In light of the complex HHR challenges described in depth in part 2 of this Science Brief, a balance should be struck between incentivizing each PCC to offer comprehensive care and ensuring that each patient has access through their primary care team to comprehensive care. Over time, those with a focused practice should be encouraged to work as part of a more comprehensive Patients Medical Home.^{36,76,77} However, most PCCs and primary care teams will need support to enhance their abilities to provide evidence-based, proactive prevention and chronic disease management for the populations they serve, especially in the context of pandemic recovery. Accountability frameworks should reflect the critical need to develop capacity to implement the Chronic Care Model in primary care teams.⁷⁸ Such capacity building should be pursued regionally in combination with community-based pharmacists, given their proven ability to work together in Ontario in structured programs to expand access to community-based preventive care.⁷⁹

Interpretation

Primary care provided through formal attachment-based relationships and through team-based models provides superior support for individuals and better outcomes for populations. To improve the pandemic response and support pandemic recovery, a focus is needed on increasing the number of Ontarians formally attached to primary

care, using creative approaches to building teams. This should be done with the goals of:

- improving access to continuous, comprehensive, and coordinated care and
- mitigating the trade-offs observed during future health system crises while ensuring cost-sustainability.

Many new relationships have been built both within primary care and between primary care and hospitals, PHUs and community/social service agencies during the pandemic; these should be viewed as investments foundational to coordinated and integrated care. OHTs provide a structure that can potentially be used to support the growth of these relationships over time. Innovative care models, both technology-enabled and supported by teams embedded in communities, require thoughtful implementation to avoid unintended consequences. The siloed databases currently used to manage pandemic-related activities and the absence of a comprehensive dataset to assess primary care activities represent significant limitations in the ability of the system to respond to future crises in a coordinated and integrated manner.

Examples abound of Ontario's primary care clinicians and teams coming together to learn, link to other parts of the health system, and to educate the public in the pandemic. These demonstrate ways to leverage the trust earned through longitudinal relationships in primary care to address public health crises. To sustain those gains, infrastructure is required to:

- enable communications across the sector and to the public,
- capture and use primary care-relevant data,
- evaluate the quality of care being provided, and
- implement targeted quality improvement initiatives and human resource supports equitably.

Such investments in primary care should be coupled with accountability frameworks and supports to address inappropriate variation in care and to ensure alignment with health system priorities. Attention to these needs will result in a primary care sector better prepared to help Ontarians in the current and all future public health emergencies.

Methods Used for This Science Brief

The following methods were used in a single common strategy to construct all three parts of this Science Brief; subsequent to the writing of the first draft of the brief, a decision was taken to divide the content into three parts.

We sought [peer-reviewed](#) literature as well as relevant pre-prints, academic presentations, reports, manuals, and other grey literature in addition to data from media scans and health system sources to construct the fullest possible picture of the impact of COVID-19 pandemic on the state of primary care in Ontario and Canada.

We searched Ovid MEDLINE and limited the search strategy to studies from January 1, 2019 to July 27, 2022 using the COVID-19 filter adapted for search strategies created by Library and Knowledge Services of the National Health Services, using the key terms: "general practitioners or physicians", "primary care, patient care team or hospital rapid response team or nursing", "community health services or community health nursing or home care services", "teams or attachment or universal or empanelment", "interdisciplinary or multidisciplinary or system or primary or policy or service or delivery", "delivery of health care", "Ontario and Canada". A grey literature search of relevant reports, manuals and policy papers was also done focusing on Primary care and COVID-19 pandemic response, Pandemic Recovery, Integration of care, and Team-Based Care. The grey literature search was not limited to the Canadian context

and yielded seven primary reports. At the request of the authors, the Ontario Medical Association library team provided a scan of media and grey literature using the team's daily in-house environmental scanning product, "The Scan", focusing on articles and other materials addressing the "state of primary care in Ontario during the pandemic" from 2021 to 2022.

Our initial search results yielded a total of 215 reports and papers, which were shared in a common folder for review and analysis by study lead authors and co-authors. These were reviewed, with lead authors for each section using those papers relevant to their portion of the Brief, and reviewed several times to ensure inclusion of relevant evidence in each section of the Brief. Unpublished emerging data was sought out from relevant health system sources such as the Ministry of Health, Ontario Health, and the INSPIRE-Primary Health Care research team, with authors permission, to supplement published data.

Expert consensus was then sought on the basis of parts 1 and 2 to draw the "lessons learned" and recommendations outlined in part 3. This was an iterative process conducted with the six core co-authors representing family physician leaders and researchers affiliated with various academic institutions in Ontario. The process included virtual meetings, email communications and clarification of language. A simple analytical framework, Search, Appraisal, Synthesis and Analysis (SALSA) was employed, and a narrative summary was generated for each of three sections of this brief.

Drafts of the brief sections were shared with primary care stakeholders across the province, the country and internationally for feedback, including primary care clinicians and leaders associated with the Ontario Ministry of Health, Ontario Health, the Ontario Medical Association and Section of General and Family Practice, Alliance for Healthier Communities, Ontario College of Family Physicians, Association of Family Health Teams of Ontario, Seamless Care Optimizing the Patient Experience, Indigenous Primary Care Council and Black Physicians Association of Ontario. Based on the feedback, the project team and the COVID-19 Science Table provided additional comments and directions for policy recommendations.

Author Contributions

This section applies across all three parts of the Brief. DaM (Danielle Martin) and FR co-conceived the Science Brief with guidance and input from KB. The approach and design were developed together with TK, AE, SN, DM, NI, IB, AP. This core author group also led the data collection, analysis and interpretation with input from the rest of the authorship team, particularly KP, LJ, JN, OB, BCF, DN, AG, MG, EM, JR, FR.

DaM, IB, AE, NI, TK, DM, SN, AP, KP wrote the first draft of the Science Brief with significant contributions from KB, AG, MG, LJ, DK, EM, DN, JR, FR. All authors revised the Science Brief critically for important intellectual content and approved the final version, and extensive work on references and figures was led by SB, AE, NSB and AP. International unpublished data were provided by MK and SH.

Robust external review was then conducted and feedback incorporation and further revision were led by TK (part 1), DM and KP (part 2), and NI (part 3), with support from SB, AE and DaM. All authors revised the parts of the Science Brief on which they are named for critically for important intellectual content.

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