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Rapid Review

Improving access to high quality team-based primary care in rural/remote/ northern Canada

Prepared for Healthcare Excellence Canada

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About

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Contents

List of Abbreviations

CEC	Collaborative Emergency Centre
CHC	Community Health Centre
CPAT	Collaborative Practice Assessment Tool
EMR	Electronic Medical Record
FP	Family physician
NP	Nurse Practitioner
NPLC	Nurse Practitioner-led clinic

Executive Summary

Strong primary care systems can contribute to improved health outcomes, health equity, and more efficient health systems. In this report, we focus on three primary care models that aim to improve access to team-based primary care, including: community health centres, nurse-practitioner-led primary care, and collaborative emergency centres. We conducted a rapid review of these three models to share:

- Information about how they improved access to care in northern and remote communities;
- Their potential to improve access to care in northern and remote communities; and
- Barriers and facilitators to implementation and sustainability in Canada's rural, remote and northern communities.

Results of this review suggest that the following factors could support or hinder the successful implementation and sustainability of team-based primary care models in rural communities:

- **Macro-level** (healthcare system, health policy, and social context): legislative and regulatory factors, funding availability, human resources management, and having clear health-system objectives and leadership support.
- **Meso-level** (organizational- and model-level components): community and patient characteristics, practice infrastructure (e.g., availability of adequate technological and administrative support), practice size and experience, team structure and working relationships, and the importance of outlining clear roles and responsibilities for all team members.
- **Micro-level** (relationships and interactions among teams, providers, and patients): such as appointment duration, as well as perceptions and beliefs of individual patient/provider.

We provide the following broad takeaways for the successful implementation and sustainability of team-based primary care models in rural, remote and northern regions of Canada:

- **Clear statement of purpose and goals of team-based primary care models at the system level**. It is also important to **communicate the purpose and goals** throughout the health system to both the leadership/decision-making and provider/team levels.
- Successful implementation of team-based care depends on **community support and participation in governance** to provide input and help identify specific community needs**,** as well as the services required to address them.
- **Access to sufficient clinic and human health resources** (staffing, budgets, and clinical infrastructure) to address the longstanding and complex unmet needs of rural and remote residents.
- **Awareness and recognition of the nurse practitioner role must be strengthened** in both the public and clinical populations.
- These models are most effective when they are **patient-centered** (e.g., they allocate time and resources to connect with patients on a range of different issues and address their needs holistically).
- **Comprehensive data must be collected and made available** in all participating jurisdictions to enable the study and evaluation of the impacts of team-based care. This process may involve the **development of new measures** specifically designed around assessing team-based care, rather than merely applying existing measures.

- A **flexible approach to community governance** may help to support the initial implementation of team-based care. This approach can be adapted and built upon over time to meet the developing needs of the community.

Introduction & Background

Strong primary care systems can contribute to improved health outcomes, health equity, and more efficient health systems (1,2). Primary care is responsible for coordinating care on behalf of patients to ensure seamless access to essential health services across the continuum of care. With the backlog of care caused by the pandemic as well as longstanding challenges to providing high-quality accessible care in rural, remote, and northern Canada, there is an urgent need to leverage and strengthen primary care in these underserved areas. Moreover, the gradual shift toward team-based care in Canada, in recognition of the improved access, experiences, and outcomes they provide, has varied, and a majority of Canadians still do not have access to a primary care team as their regular point of care (3). These challenges raise questions about how to support and strengthen high-quality team-based primary care in rural/remote/northern Canada.

Existing studies of primary care reforms in Canada have identified some promising initiatives aimed at improving access to team-based primary care that warrant further attention (4–7). Some notable examples include the widespread use of community health centres in the Northwest Territories, the increasing use of nurse-practitioners (NPs) in rural and northern Ontario and Saskatchewan (8), and the emergence of collaborative emergency centres in Nova Scotia and Saskatchewan that take on primary care functions in the context of limited supply (9,10).

This rapid review draws lessons from these promising models of team-based primary care—nurse practitioner-led clinics (NPLC), community health centres (CHC), and collaborative emergency centres (CEC)—that have the potential to improve access to care in rural, remote, and northern communities.

Methods

Literature review

We searched three electronic databases: OVID Medline, OVID Embase, and CINAHL. This search utilized medical subject headings (MeSH) and keywords related to team-based care, primary health care, and delivery of health care in the Canadian context We also searched government websites, professional associations, advocacy groups, and newspaper archives for publications about select team-based primary care interventions across each jurisdiction. See Appendix A for the detailed methodology, including the search strategy terms.

We used Covidence, a web-based management software, to remove duplicates and screen articles in two phases: 1) titles and abstracts, and 2) full-text articles. At the start of each phase, reviewers selected a random sample of six articles to screen and compare results to pilot the selection criteria. The titles and abstracts of citations whose eligibility was uncertain (rated "maybe") were directly included for full-text review; during full-text review, any uncertain articles were reviewed by the team.

Sources that described any of our three selected models of team-based primary care (NPLC, CEC, and CHC) in any Canadian jurisdiction were included for review, as defined in Table 1. As well, we included articles that described elements of team-based care in rural, remote and northern areas, and excluded sources from solely urban settings, as outlined in Table A2. Rural areas are defined by Statistics Canada as "any territory lying outside population centres" or alternatively "those with less than 1,000 people and a population density of fewer than 400 persons per square kilometre" (11,12). This report broadly considers areas outside of medium or large urban population centres (30,000 or more inhabitants) as rural or remote. Finally, we extracted information on the characteristics of each model as well as factors and contexts impacting their implementation and sustainability (Appendix B).

TABLE 1. Model descriptions and definitions

Collaborative Emergency Centres	Primary care teams that provide urgent and emergency care, operating 24 hours a day, and in collaboration with local emergency health services (13,14).
Community Health Centres	Primary care teams that are "characterized by: community governance; a focus on particular population needs and social determinants of health; an expanded scope of health promotion, outreach and community development services; and salaried interprofessional teams"(15).
Nurse practitioner-led clinic	A primary care team that is an "interprofessional team-based model for delivering comprehensive primary health care to populations, in which nurse practitioners provide the majority of care" (16). Any interprofessional primary care setting where nurse practitioners provide the majority of care will be included. Nurse practitioner-led clinics that are privately operated were excluded (17).

Key informant interviews

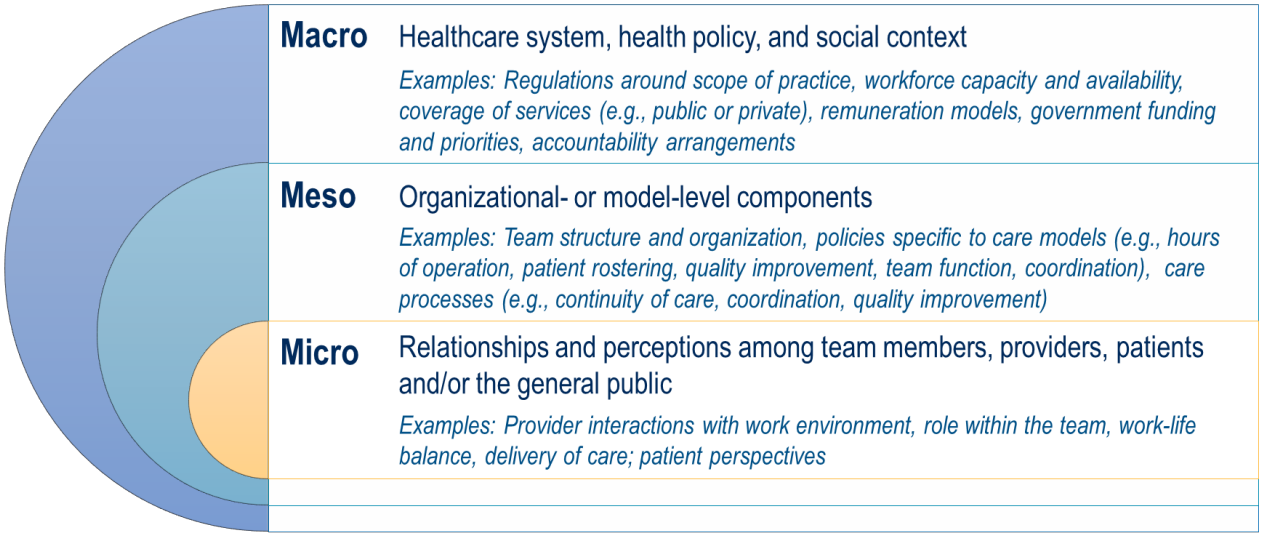
We conducted interviews with individuals directly involved in the development, implementation, and/or delivery of CHCs, NPLCs, and CECs. The interviews aimed to understand the mechanisms and supports for improved access, quality, and cultural safety of team-based primary care models as well as the barriers and facilitators of their implementation. We identified prospective participants through the

literature review, professional networks, and snowball sampling. Our intent was to interview 10–12 key informants (three participants per model in one to two jurisdictions each) in August 2022. We carried out interviews in British Columbia and Ontario for CHCs, and Saskatchewan and Ontario for NPLCs. We developed literature review case summaries of each model and shared them with our selected participants prior to their interviews. Semi-structured interviews were conducted virtually using Zoom (see Appendix C for the Interview Guide). Each interview was conducted by two research team members, where one member led the interview and the other took notes. All interviews were audio recorded and transcribed using Zoom's automatic transcription function. Ethics approval was granted by the University of Toronto Research Ethics Board (#35088).

Conceptual framework and synthesis

To describe the barriers and facilitators that contribute to the successful implementation and sustainability of team-based models, we developed a conceptual framework that enabled us to synthesize diverse aspects related to primary care systems, implementation science research, and program/policy planning and evaluation (18–20). The resulting framework categorizes factors related to implementation and sustainability of team-based care models into macro, meso, and micro levels (Figure 1).

FIGURE 1. Conceptual framework: Factors related to implementation and sustainability of team-based models



Framework informed by: Bourgeault & Mulvale, 2006; Fletcher et al., 2021; Suter et al., 2009

We extracted and summarized information from the literature using this framework to describe barriers and facilitators to implementation and success of team-based primary care models. We summarized interview data through deductive coding with the interview questions as a general guide; this process was used to generate case summaries. We further compiled information from the literature review and key informant interviews to further characterize the barriers and facilitators to the implementation and success of our three models.

Limitations

This review has some limitations worth noting. First, we restricted our search to English-language sources (though a grey literature search in Quebec included French-language websites and sources, English translations were available). Second, many articles described more than one care model, more than one example of a single care model, or care models in multiple regions and jurisdictions. This made it challenging to discern which findings were best ascribed to which care model, as well as which findings were specifically relevant to remote or rural geographies. Our search strategy had a narrow focus on three specific models of care, and it did not target specifically Indigenous-led primary care team models that were developed by or serve Indigenous communities. Further community-partnered research is therefore needed to learn from these promising models of care (e.g., team-based healthcare in Yellowknife Frame Lake and Fort Smith clinics) (21). Due to time constraints, we were unable collect sufficient data and information to write up case studies on CHCs in the Northwest Territories or on CECs in Nova Scotia. Finally, our review relied on published information about CHCs, CECs, and NPLCs, and our interviews were held in only two jurisdictions each (for CHCs and NPLCs), therefore we may have missed characteristics of these models that are specific to jurisdictions beyond the scope of this study, or that were not captured in the literature.

Analytic Overview

We extracted 31 academic publications containing information on primary care reported in one (n=24) or multiple (n=7) jurisdictions across Canada. Academic publications described CHCs (n=14), NPLCs (n=11), CECs (n=3), and often included comparisons across multiple model types. There were 7 publications that had unspecified team-based care models. Our grey literature search identified reports from Alberta, Ontario, Nova Scotia, Nunavut, and Prince Edward Island, and other sources from various jurisdictions across Canada. We conducted 11 interviews with key informants who were involved in the development, implementation, and/or delivery of the following team-based primary care models: CHCs and general team-based primary care models in British Columbia, CHCs and NPLCs in Ontario, primary care clinics with NPs in Saskatchewan, and general information about team-based primary care models in the Northwest Territories. Due to time constraints, we were unable to secure interviews with key informants involved in community-governed CHCs in the Northwest Territories nor in CECs in Nova Scotia. The case summaries for CHCs in Ontario and British Columbia and NP-led or -involved clinics in Ontario and Saskatchewan are available in Appendix D.

Overall, a summary of the factors that support the implementation and sustainability of team-based care described in the literature and by local experts are summarized by framework level below.

Macro-level factors influencing model implementation and success

TABLE 2. Summary of macro-level factors

Factor	Description/Example
Legislation and regulation	Models were believed to be more effective when providers had the authority to work to the full scope of their practice
Funding and remuneration	Sustainable, long-term funding was viewed as essential for empowering providers to work within the model
Health system objectives and leadership support	Aligning care models with broader health system objectives (e.g., a focus on patient-centred care) helped to garner support and recognition for the models; Health authority and leadership support and advocacy for innovative models of team-based care helped to garner recognition of their value
Workforce training and competencies	Equipping providers with team-based training and skills during post-secondary education was expected to improve model success
Human resource management	Structures and processes for hiring staff and training opportunities were considered important for effective team-based models

Legislation and regulation

Legislation appeared to play an important role in supporting or limiting team-based practices across the included publications. For example, in Ontario it is considered within a NP's scope of practise to prescribe medications and order tests. However, across care models, NP's scope of practice was limited by regulations regarding the number of medications they could prescribe and tests they could order (22). Expert informants confirmed similar limitations to NP scope of practice in Ontario and

Saskatchewan. This tended to limit the number of tasks NPs could share with family physicians (FPs) (18). As a result, NPs and family practitioners reported caring for different groups of patients, with NPs working more closely with patients from vulnerable groups who required more time-intensive care than those with complex conditions, such as acute or chronic illnesses (22). In some jurisdictions, like Nova Scotia, NP practices were limited even further, as no legislation permits them to work in team-based care models (23). In Quebec, there was evidence of a regulation that supported the implementation of collaborative care models. Specifically, throughout the province it was mandatory that all NPs working in primary care (referred to as primary healthcare NPs [PHCNP]) sign a partnership contract with FPs, establishing the rules of collaboration and each other's roles and responsibilities (24). This supported the implementation of CHCs[1] and the model's ongoing success in Quebec by ensuring a common set of standards and expectations between the two professions.

Funding and remuneration

Across the included publications and based on our discussions with experts, funding and remuneration structures appear to influence the success of team-based care model implementation. Challenges related to funding appeared particularly pronounced in British Columbia, where the province's funding commitment for NP-role expansion in CHCs was originally limited to 3-years (25). This contributed to role uncertainty among NPs, complicating recruitment and retention in the NP workforce and compromising patient management in the practices. In Ontario and Nova Scotia, NP role integration into team-based care was also challenged by a lack of funding to support after-hours care (26,27). Similarly, in Quebec, NPs were prevented from being paid any overtime, leading them to feel undervalued (28). In Ontario, NPLCs were not offered any community-development funding, preventing nurses from caring for their medically complex patients in the community (29). Ultimately, these types of funding and remuneration restrictions served to restrict NP contributions, effectiveness, and satisfaction in the collaborative models.

Physician-centered policies around billing and reimbursement in primary care tended to limit the success of team-based care delivery, particularly for care provided by NPs. In British Columbia, medical records and billing practices were centred around physician-delivered care and did not reflect NP care delivery, which caused frustrations for NPs (25). When NPLCs were first introduced in Ontario, specialists could only be reimbursed for referrals by physicians, which meant that referrals from NPs could not be processed effectively. In addition, broader primary care initiatives, such as incentives for enrolling patients into primary care practices, similarly only targeted physicians thereby limiting the number of patients who may seek care by NPs. There were also noted billing issues with insurance carriers, where prescriptions written by NPs would have to be co-signed by physicians in order for claims to be approved. There is also evidence from Alberta to suggest that plans for physician renumeration other than fee-for-service can support team-based care initiatives (30). For example, Alternative Relationship Plan (ARP) funding agreements were implemented in two primary care clinics in Alberta, where physicians were renumerated through capitation payments (30,31). It was described that such changes incentivized physicians to work collaboratively within teams and allowed physicians to provide comprehensive care during appointments (30,31).

[1] CHCs in Quebec are also referred to as local community service centres (CLSCs)

The specific remuneration models for NPs and other professionals may also incentivise or de-incentivise collaborative, team-based practices. For example, Lukey et al. (2021) commented on how fee-for-service models for FPs disincentivized their collaboration with NPs and other allied health professionals. This is in part because within these models, FPs are compensated for the number of patients they can see within a set period, rather than the comprehensiveness of the care they deliver (32). In NPLCs in Ontario and British Columbia, set salaries for NPs were seen to allow them to deliver more comprehensive care to complex patient populations (33,34). Despite this, in Ontario, a lack of scheduled pay increases for NPs in these settings appears to have compromised retention and recruitment to the profession; however, further details on the specific funding practices were not available. Creating funding incentives to encourage FPs to work with NPs was viewed by one expert informant as a way of supporting CHC implementation in the future.

Health system objectives and leadership support

Implementation success appears to be influenced by the extent to which team-based primary care models fit within broader health system objectives and that garnered leadership and community support (1,26,28,32,35–39). For example, in British Columbia, a lack of long-term planning around the NP profession made it more difficult to implement NPLCs (36). Similarly, in Quebec, perceived uncertainty in the long-term support for the role of NPs led some in this profession to feel less engaged and committed to their work (28); these concerns may impact the number of NPs who take on leadership positions and pursue roles in primary care settings (28). To successfully implement the team-based care models, jurisdictions needed strong support from the health authority and collaborating FPs (1).

Support from FPs/general practitioners was essential to implementation and sustainability of team-based care. For example, physician support was seen to contribute to the implementation of CECs in Nova Scotia, whereas the lack of buy-in from physicians appeared to have limited the expansion of NPLCs in Ontario (26,37). Similarly, in British Columbia, Alberta, Ontario, and Quebec, collaboration and co-creation with professional associations seemed to help create buy-in and support for CHCs (32). Expert informants indicated that political lobbying from medical associations against team-based models of care may have served to restrict their implementation in Ontario and British Columbia. However, the experts also noted that although the medical associations were meant to represent the collective voice of medical professionals in their jurisdictions, there was still considerable support for team-based care among individual FPs and from some professional organizations such as the Ontario College of Family Physicians.

One expert informant had observed a lack of political will to implement community health centres in British Columbia. Other informants commented on a critical lack of attention to evaluating the implementation of CHCs and NPLCs in Ontario and British Columbia. Further, few measures had been developed on team-based care specifically, making it more challenging for researchers to conduct evaluations. Informants suggested that this limited investment in measurement and evaluation signalled limited support for the models. Despite this, expert informants shared anecdotal evidence of patient feedback on the value of these models.

Workforce training and competencies

Workforce training programs appear to support the implementation of team-based primary care models across Canada. There was recognition in Quebec that health professional training programs should focus on fostering collaborative practices between professions in order to support CHCs (40). Additionally, emphasis on continuing education opportunities that focus on family practice nursing competencies has been regarded as a way to promote stronger team functioning in these models across Canada (41). An expert informant from British Columbia also noted a lack of expertise within the government for forming meaningful community partnerships. This lack of expertise made it more challenging to successfully implement community health centres throughout the province.

Human resource management

The structure and management of human resource issues may also support or limit the successful implementation of team-based models. Drawing from the 2017 Report of the Auditor General on Health Care Services in Nunavut, CHCs had two separate departments responsible for hiring its staff and health personnel (42). While CHCs operated through the Department of Health, the Department of Finance was also responsible for coordinating staffing processes, and a lack of coordination between departments was considered ineffective in filling vacancies (42). The report also found there was a lack of dedicated funding for training and orientation programs, as well as limited time for senior personnel to coordinate and implement training for new hires, which could impact day-to-day operations. Expert informants confirmed that recruitment and retention of staff in Ontario and British Columbia was an important challenge facing model implementation.

Meso-level factors influencing model implementation and success

TABLE 3. Summary of meso-level factors

Factor	Description/Example
Information technology and systems	The type and availability of various technologies to support model implementation and success
Community and patient characteristics	In the context of high levels of patient complexity, and historic and ongoing poor access to care, the number of patients that a model can support is limited
Practice size and experience	Smaller practices generally had better outcomes and more long-standing practices were believed to have stronger interprofessional collaboration than new practices
Clear roles and responsibilities	Clear roles and responsibilities for all team members within the organization led to more efficient care
Team structure and working relationships	Multiple NPs working within the same practice resulted in higher perceived support within teams
Availability of administrative support	Funding for an administrative professional helped to organize and manage team member responsibilities

Information technology and systems

The use and type of information technology and systems tended to impact opportunities for effective team-based care. The use of consistent electronic medical record (EMR) systems within and across models and jurisdiction wide was an important component to effective team-based care (32). For example, in Ontario, while EMR systems are widely available, there is limited interoperability and performance measurement in these systems; this was reported as an area of improvement for better supporting team-based care initiatives in Ontario (43). This lack of integration between EMRs was also a challenge in British Columbia, as different types of health care providers had access to different types of information. In Nova Scotia, the lack of a unified electronic documentation system between collaborative emergency centres and other departments created inefficiencies and added extra work for providers across these settings (44).

Community and patient characteristics

The implementation and success of team-based care appears to depend on various community and patient characteristics. For example, when working as part of interprofessional CHCs in Ontario, NPs and FPs often attended to different patient populations. Women, children, and patients from vulnerable groups were more often seen by NPs, whereas patients with chronic illness or serious acute conditions were often seen by FPs (22). NPs working in northern British Columbia were also reported to care for different patients than their physician colleagues—particularly those with especially medically or socially complex care needs (45). There also appeared to be differences in continuity of care across patient populations. Older patients and individuals with chronic conditions reported higher continuity, whereas younger, more educated patients, as well as those living in rural areas often experienced lower continuity (46). These findings suggest that the appropriate ratio of physician to non-physician team members—an important factor for managing patients with chronic diseases—may differ between communities (32).

Authors also detailed how the implementation of CHCs and NPLCs in British Columbia and Ontario was challenged by the existing barriers to accessing primary care in certain communities. For example, some practices were established in regions where populations previously had limited access to primary care, and thus there were a greater number of unattached and medically complex patients (26,47). In one NPLC in Ontario, the increased workload needed to address patients' complex health needs, which had not been addressed for many years due to physician shortages, limited the number of patients that could be served and required more physician involvement (26).

Practice size and experience

Several of the publications described the impact of practice size on the implementation of team-based care. In Ontario, CHCs consisting of smaller teams seemed to be associated with higher Collaborative Practice Assessment Tool (CPAT) scores (48,49)[2], and higher continuity of care (46). A similar finding was reported for their counterparts in Quebec, where smaller teams were associated with more efficient integration processes (24). Additionally, they also found that team-based practices (including CHCs) with

[2] The Collaborative Practice Assessment Tool (CPAT) measures the degree of collaboration in clinical teams through a 57-item, self-administered tool. Higher values indicate a higher level of collaborative practice.

four or more FPs had a harder time managing patients effectively than those with three or fewer (24). One expert informant also commented that the availability of physical space was essential for CHC implementation. Specifically, a sufficient number of examination rooms to accommodate multiple providers was important to allow NPs and FPs to work together as a team.

There were also differences in the level of interprofessional collaboration and care delivery depending on the number of years since the practice was established. Khan et al. (2021) found that in Ontario CHCs, there was a positive association between the number of years since a primary care practice had been established and the practice's CPAT score. Another study reported that patients experienced higher continuity of care when their FP had more than two years of experience with the CHC and continuity of care was positively correlated with the number of years since the FP's graduation (46).

Clear roles and responsibilities

Unclear roles and responsibilities within primary care teams were commonly identified and discussed barriers to the implementation of team-based primary care. In particular, several studies pointed to a lack of understanding amongst team members regarding NP's scope of practice (23,28,36,50). This barrier was also acknowledged by expert informants in Ontario and Saskatchewan. In Ontario, one study found that NPs working in collaborative primary care practices often viewed their roles and responsibilities differently than patients and other team members (e.g., physicians, receptionists) who had more "traditional understandings" of provider roles (50). This led to clinic staff scheduling patient appointments with FPs instead of NPs, even when the patient's needs were within the NP's scope of practice (50). Similar sentiments were also expressed by NPs studied in Quebec, British Columbia, and Alberta, who felt that their ability to engage in their full scope of practice was hindered by other care team members' misunderstandings and underappreciation of NP roles (28,32). Additionally, differences in team composition among primary care teams in British Columbia often led to varied NP roles e.g., to fill service gaps in existing programs and clinics—further contributing to role confusion (45). For example, NPs who worked in a CHC may need to take on additional roles such as sexual education for schools, health promotion, or women's health clinics if the typical care providers for these services, such as public health nurses, health promoters, or counsellors are not employed in those settings (45).

The included publications also suggested several strategies to address the lack of NP role clarity, including better planning within the primary care teams (26,29,36,51). Involving all team members in discussions to clarify roles and responsibilities from the outset (i.e., during the hiring process) was critical to effectively integrating NPs into various team-based care models (26,36,51). By clarifying roles and responsibilities, teams were able to take full advantage of all members' skill sets and provide more efficient care (29). In addition, there were several mentions of a need to improve education for both health professionals and members of the public regarding NP roles (25,26). Finally, the use of an NP-led governance structure appeared to better allow NPs to engage in their full scope of practice, which in turn facilitated the implementation of an NPLC in Sudbury, Ontario (26). For example, in an NP-led governance model, the board would be cognizant of the NP's scope of practice in their jurisdiction and could develop clinic policies that would allow NPs to work to their full scope of practice (26).

Team structure and working relationships

Across many of the publications, highly collaborative, interdisciplinary work environments were deemed important for effective team-based care because they "foster a positive work climate and help to

optimize quality of care and patient management" (51). Studies from Quebec, Ontario, and British Columbia reported that a lack of effective communication between team members could weaken working relationships by failing to clarify the team's objectives or to promote acceptance of all team members (26,51). For example, when working in interdisciplinary teams, differences in culture, values, and/or beliefs often created tension between team members of different professions (e.g., RN's were often initially unwelcoming to NPs) (14,40). Several strategies have been proposed by NPs to improve interprofessional relationships, including the allocation of resources for the development of programs intended to promote communication and acceptance (29).

Also highlighted was the significance of organizational and team structures for promoting collaborative and productive working relationships. For example, in Quebec, CHCs with at least two NPs were more efficient than those with less than two NPs—demonstrating the potential importance of peer-to-peer support among NPs (24). The physical workplace infrastructure also played an important role, with co-location being associated with more effective care; however, this was limited by the availability of sufficient physical space within clinics (32). Others indirectly expressed the importance of team structure by stating their beliefs that their respective workplace was improperly structured, albeit they did not elaborate further (45).

Availability of administrative support

The availability of reliable administrative support was often described as a facilitator to the effective implementation of team-based primary care (36,40,51). In particular, individuals with relevant experience and knowledge tended to provide the most effective support. For example, in Quebec CHCs, nursing managers were able to better support NPs than general service managers who were less familiar with the NP role (24). Additionally, in Nova Scotian CECs, administrative support—such as that from Emergency Health Service (EHS) operations—helped facilitate the integration of additional paramedics into the team (14). On the other hand, some publications reported mixed results regarding the exact effects of administrative support on intra-team collaboration. For example, in Ontario CHCs, the use of centralized administrative processes (e.g., for patient referrals or enrolment) were negatively correlated with CPAT scores; however, the use of a wide variety of information-sharing mechanisms, described as exchanging more than four types of information, was positively correlated with CPAT scores (48). One expert informant also mentioned that hiring a business manager to support initial NPLC or CHC planning was a key implementation facilitator.

Micro-level factors influencing model implementation and success

TABLE 4. Summary of micro-level factors

Factor	Description/Example
Appointment duration	Longer appointments were expected to allow providers to deliver more comprehensive care
Patient perceptions and beliefs	Some patients held traditional beliefs about primary care and were reluctant to receive care from a non-physician provider
Provider perceptions and beliefs	Some care providers had difficulty adapting to a team-based model

Appointment duration

Case studies of rural NPLCs in British Columbia revealed that increasing the length of appointments from 10 to 20–30 minutes was looked upon favourably by patients who felt the longer appointments improved their engagement in their own care planning and reduced the need for subsequent appointments (34). In addition, provider autonomy in determining appointment length and frequency for each patient allowed NPs to address multiple concerns per visit; this also suggests better medical control of their patients' conditions (29).

Patient perceptions and beliefs

Patient awareness and perceptions regarding the roles of various providers may impact the implementation of team-based care models. Studies conducted in CHCs in both Ontario and British Columbia found that patients often had traditional understandings of provider roles and thus preferred to been seen by physicians over NPs (26,50), as they were concerned that seeing an NP first would delay access to a physician (26). However, these traditional beliefs about NP and FP roles were not held by all patients, as expert informants commented that many patients had written letters of support or participated in other advocacy efforts to implement NPLCs in Ontario and Saskatchewan. In Ontario, the establishment of the first NPLC was accompanied by local media coverage to help increase community awareness about the NP role (26). One study from rural Alberta found that having strong community ties was important for patients to be receptive to the NP role (52). This was confirmed by expert informants, who noted that successful implementation of NPLCs and CHCs in Ontario depended on the strength of the partnership between the community and providers. Improving acceptance of non-traditional care provision amongst patients may also help the recruitment of providers to team-based practices. For example, paramedics in Nova Scotia were more likely to work in CECs if community perceptions were positive (e.g., patients were satisfied with their care) (14). Expert informants also indicated that in general, model implementation was strengthened when patients, families, and NPs were involved in the planning. To support patient and family involvement in planning, one expert suggested a flexible community governance model, where over time, CHCs could adjust and enhance the authority of community board members as long as they met some minimum criteria.

Provider perceptions and beliefs

Based on the included studies and discussions with experts, successful collaboration within team-based primary care models may be supported or limited by provider perceptions around interdisciplinary collaboration and professional identity. For example, one study that surveyed program co-ordinators in Quebec CHCs found that attitudes and beliefs around working within one profession impacted the extent of interprofessional collaboration; therefore, team members who tend to agree with traditional beliefs may have difficulty adapting to a team-based model (40). However, several of these individuals also understood the potential benefits of interdisciplinary collaboration (40). Through a realist review and case study approach, another study found that open-mindedness and mutual trust among team members were important components for NP and team collaboration within primary care teams (51). Similarly, expert informants noted discrepancies in professional ideologies on caring between different health professions. Specifically, the implementation of team-based care models was supported when providers were encouraged to think holistically about the needs of the patient, rather than focus on episodic care.

Conclusions

Key findings

Through our targeted search of academic and grey literature and our key informant interviews we identified several barriers and facilitators to the implementation of three promising team-based primary care models—CHCs, NPLCs, and CECs—in rural, remote, and northern regions of Canada. In terms of macro-level factors, legislation and regulation either hindered or facilitated implementation, while limited funding, poor human resource management, and a lack of clear health systems objectives all acted as barriers. At the meso-level, effective implementation strategies not only appear to depend on community and patient characteristics, but also practice characteristics such as practice size, infrastructure, and experience level. Additionally, intra-team dynamics (i.e., team structure and working relationships) and the clarity of team member roles and responsibilities were important factors impacting each model's implementation and sustainability. Finally, certain micro-level factors—appointment duration and individual patient/provider perceptions and beliefs—also affected the implementation of these team-based care models.

Key considerations for supporting scale and spread of these models

Given our findings, we provide the following broad takeaways to best ensure the successful implementation and sustainability of these models in Canada's rural, remote, and northern regions:

- **Clear statement of purpose and goals of team-based primary care models at the system level**. Also, it is important to **communicate the purpose and goals** throughout the health system both at the leadership/decision-making level and the provider/team level.
- Successful implementation of team-based care depends on **community support and participation in governance** to provide input and help identify specific community needs**,** as well as the services required to address these needs.
- **Access to sufficient clinic and health human resources** (staffing, budgets, clinical infrastructure) to address the longstanding and complex unmet needs of rural and remote residents, and health worker shortages that have been exacerbated by the COVID-19 pandemic.
- **Awareness and recognition of the NP role must be strengthened**, both in the public and clinical populations.
- The models are most effective when they have a **more patient-centered focus** (e.g., have the time and resources to connect with patients on a range of different issues and address their needs holistically).
- **Comprehensive data must be collected and made available** in all jurisdictions to study and evaluate the impacts of team-based care. This process may involve the **development of new measures** specifically designed around assessing team-based care, rather than applying existing measures.
- A **flexible approach to community governance** may be beneficial to support the initial implementation of team-based care. This approach can be adapted and built upon over time to meet the needs of the community.

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Appendix A. Detailed Methodology

Literature Review

We carried out a targeted search of academic literature in three bibliographic databases (OVID(Medline), OVID(Embase), and CINAHL). We used a combination of database-specific syntax (e.g., Medical Subject Headings) and keywords related to team-based care, primary health care, and delivery of health care in Canada. We first developed the search in MEDLINE (see Table A1) and later into other database-specific syntax. All final electronic database searches were conducted and exported on March 10, 2022.

TABLE A1. Electronic database search strategy (March 10, 2022)

MEDLINE	SYNTAX	RESULT
1	Patient Care Team/	68610
2	(patient care team* or team-based care or interprofessional care or interprofessional team* or collaborative care or multiprofessional care or multiproessional team* or medical care team*).tw,kf.	8280
3	1 or 2	74544
4	Primary Health Care/	86901
5	(primary care or primary healthcare or primary medical care or family health team* or community health centre* or community health center* or nurse practitioner led clinic* or nurse practitioner-led clinic* or “nurse adj3 clinic*” or collaborative emergency centre* or collaborative emergency center* or rural emergency department* or general practice* or family medicine).tw,kf.	185828
6	4 or 5	216177
7	canada/ or alberta/ or british columbia/ or manitoba/ or new brunswick/ or “newfoundland and labrador"/ or northwest territories/ or nova scotia/ or nunavut/ or ontario/ or prince edward island/ or quebec/ or saskatchewan/ or yukon territory/	173357
8	(Canada or Canadian* or Quebec or Ontario or New Brunswick or Prince Edward Island or Newfoundland or Labrador or Manitoba or Saskatchewan or Alberta or British Columbia or Northwest Territories or Yukon).tw,kf.	181925
9	7 or 8	254454
10	3 and 6 and 9	510
EMBASE	**SYNTAX**	**RESULT**
1	patient care/	328489
2	(patient care team* or team-based care or interprofessional care or interprofessional team* or collaborative care or multiprofessional care or multiproessional team* or medical care team*).tw,kf.	10978
3	primary medical care/ or primary health care/	189423
4	(primary care or primary healthcare or primary medical care or family health team* or community health centre* or community health center* or nurse practitioner led clinic* or nurse practitioner-led clinic* or “nurse adj3 clinic*” or collaborative emergency centre* or collaborative emergency center* or rural emergency department* or general practice* or family medicine).tw,kf.	244790
5	3 or 4	310846
6	1 or 2	336040
7	canada/ or alberta/ or british columbia/ or manitoba/ or new brunswick/ or “newfoundland and labrador"/ or northwest territories/ or nova scotia/ or nunavut/ or ontario/ or prince edward island/ or quebec/ or saskatchewan/ or yukon territory/	210253

8	(Canada or Canadian* or British Columbia or Manitoba or New Brunswick or Newfoundland or Labrador or northwest territories or nova scotia or nunavut or ontario or prince edward island or quebec or saskatchewan or yukon).tw,kf.	248875
9	7 or 8	316677
10	5 and 6 and 9	1215
CINAHL	**SYNTAX**	**RESULT**
1	(MH "Multidisciplinary Care Team")	48,388
2	TI ((patient care team* or team-based care or interprofessional care or interprofessional team* or collaborative care or multiprofessional care or multiprofessional team* or medical care team*)	483
3	AB (patient care team* or team-based care or interprofessional care or interprofessional team* or collaborative care or multiprofessional care or multiprofessional team* or medical care team*)	10,227
4	S1 OR S2 OR S3	57,321
5	(MH "Primary Health Care")	70,195
6	TI (primary care or primary healthcare or primary medical care or family health team* or family care team* or community health centre* or community health center* or nurse practitioner led clinic* or nurse practitioner-led clinic* or "nurse N3 clinic*" or collaborative emergency centre* or collaborative emergency center* or rural emergency department* or general practice* or family medicine)	51,97
7	AB (primary care or primary healthcare or primary medical care or family health team* or family care team* or community health centre* or community health center* or nurse practitioner led clinic* or nurse practitioner-led clinic* or "nurse N3 clinic*" or collaborative emergency centre* or collaborative emergency center* or rural emergency department* or general practice* or family medicine)	87,275
8	S5 OR S6 OR S7	136,044
9	(MH "Canada+")	109,327
10	TI (Canada or Canadian* or Quebec or Ontario or New Brunswick or Prince Edward Island or Newfoundland or Labrador or Manitoba or Saskatchewan or Alberta or British Columbia or Northwest Territories or Yukon)	38,693
11	AB (Canada or Canadian* or Quebec or Ontario or New Brunswick or Prince Edward Island or Newfoundland or Labrador or Manitoba or Saskatchewan or Alberta or British Columbia or Northwest Territories or Yukon)	66,725
12	S9 OR S10 OR S11	142,561
13	S4 AND S8 AND S12	458

We also searched government websites, professional associations, advocacy groups, and newspaper archives for publications about the select team-based primary care interventions across all Canadian jurisdictions.

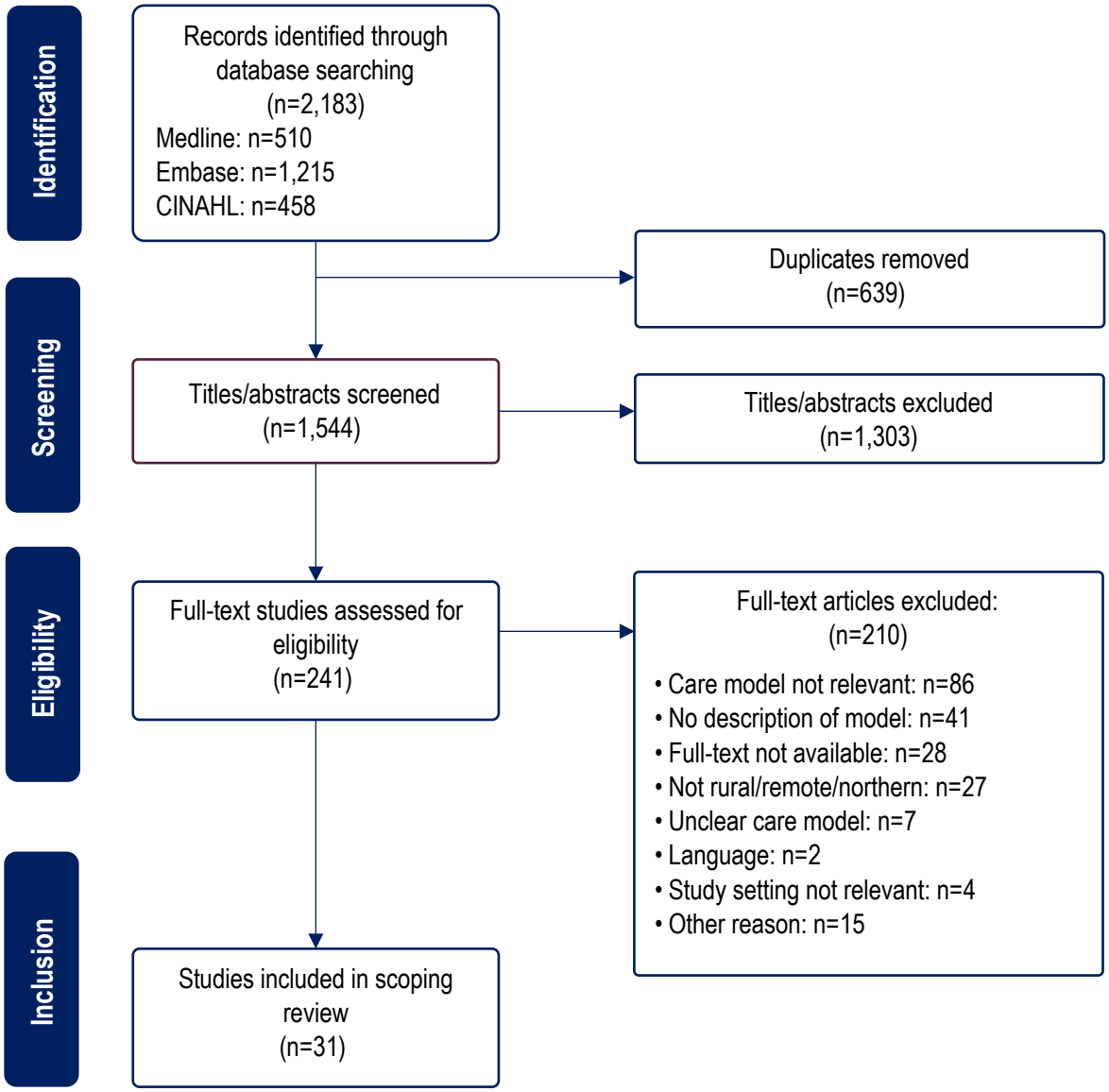
Duplicates removal and screening was conducted through a web-based systematic review management software, Covidence. Screening was performed sequentially in two phases: 1) titles and abstracts, and 2) full-text articles. At the start of each phase, reviewers selected a random sample of six articles to screen and compare results to pilot the selection criteria. The titles and abstracts of citations whose eligibility was uncertain (rated “maybe”) were passed directly to full-text review; during full-text review, any uncertain articles were reviewed by the team.

Articles were included if they met the criteria outlined in Table A2.

TABLE A2. Inclusion and exclusion criteria

Inclusion	Exclusion
• Any study design (including experimental or pilot models) that describes elements of 'team-based care' models in a rural, remote, or northern area of Canadian jurisdiction • Team based care models include Nurse-Practitioner Led Clinics, Community Health Centres, Collaborative Emergency Centres (as described in Table 1) • English • May include studies related to COVID-19	• Team-based care model that are exclusively in urban settings • Sources that do not describe team-based care models • Sources that describe team-based care models out of scope; e.g., Family Health Teams, Family Medicine Groups, Primary Care Networks

FIGURE A1. PRISMA Flowchart



Adapted from: Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta analyses: the PRISMA statement. PLoS Med. 2009 Jul 1;6(7):e1000097. doi:10.1371/journal.pmed1000097

Appendix B. Summary of the Academic Literature

Author, Year	Jurisdiction	Model	Macro-level factors	Meso-level factors	Micro-level factors
Bailey et al., 2006	ON	Unspecified; CHC	• Potential medico-legal liability requiring providers to constantly demonstrate their competence (B)	• Role clarity within the organization over provider scope of practice and responsibilities (B) • Traditional hierarchical relationships and role understandings (B) • Differences in ideologies between providers (B)	• Traditional understandings of roles among patients (B)
Burgess et al., 2011	BC	Unspecified; CHC	• Legislation governing scope of practice and title protection (F) • Funding for NP training programs and role start-up (F) • Inconsistency in policies and procedures across regions (B) • Inadequate funding mechanisms to support long-term integration (B)	• Role clarity within the organization (F) • Cultivating strong relationships with colleagues (F)	NA
Callaghan et al., 2017	NS	Unspecified	• Poor remuneration mechanisms (B)	• Team structures that promote efficiency (F)	NA
Chouinard et al., 2017	QC	CHC (and others)	• Integration of mandatory partnership contracts between providers (F) • Availability of leadership support (F) • Lack of structures to support communication between disciplines (B) • Local and regional implementation committee support (F/B)	• Horizontal support between NPs (F) • Cultivating strong relationships with colleagues (F) • Smaller team sizes (F) • Leadership support (F) • Role clarity among leaders and colleagues (F)	NA
Contandriopoulos et al., 2015	QC	CHC (and others)	• Regulations on patient enrolment with providers (F)	• Advance planning for NP integration (F) • Role clarification involving NPs (F) • Access to continuing education (F) • Strong communication mechanisms (F) • Shared values and vision (F)	• Recognition of NP role and trust within team (F)
Côté, et al., 2019	QC	CHC (and others)	• Poor remuneration mechanisms (B) • Anticipated healthcare reforms (B) • Conflicting professional paradigms (B)	• Role recognition and understanding within the team (B) • Limitations on scope of practice (B)	NA
Dahrouge et al., 2014	ON	CHC	• Legislation governing provider scope of practice (B) • Availability of funding (B)	• Continuing professional development (F) • Access to education programs was challenging (B)	NA

Author, Year	Jurisdiction	Model	Macro-level factors	Meso-level factors	Micro-level factors
				• Role clarity within the organization over provider scope of practice and responsibilities (F)	
DiCenso et al., 2010	BC, ON	Unspecified (NPLC)	• Leadership and health authority support (F) • Clear processes for role introduction and evaluation (F) • Establishing supportive policies and environments (F) • Promoting team functioning through mutual respect (F) • Longstanding hierarchies and views among health professionals (B) • Community characteristics (e.g., number of unattached patients in the community, level of medical complexity) (F/B) • Shortages of other care providers (F) • Enabling NPs to work to full scope of practice (F) • Opposition towards the NP role and model (B) • Poor funding mechanisms (B)	• Local media coverage to promote role awareness (F) • Cultivating strong relationships with colleagues (F) • NP-led governance structure (F) • Role clarity within teams (F) • Establishing concrete goals and mission statement (F) • Strategies to enhance communication (F)	• Historical views on the NP role (B)
Hayden et al., 2015	NS	CEC	NA - Provided descriptive information about model		
Heale et al., 2018	ON	NPLC	• Poor funding and remuneration mechanisms (B) • Lack of community development funding (B) • Community characteristics (B) • Maintaining a medical lens (B) • Recruitment and retention of NPs (B)	• Lack of community outreach programs (B) • Allowing NPs to work to their full scope of practice (F) • Role clarity among teams (B) • Programs and partnerships in place to reach out to the community directly (F) • Flexible organizational processes and perspectives (F)	NA
Heale et al., 2018	ON	NPLC	• Salaried remuneration of NPs (F)	NA	NA
Hunter et al., 2016	AB	Unspecified	• Sustainability of funding for NPs (B) • Flexible service delivery (F) • Public education on the NP role (F)	• Accessing ongoing education and role isolation (B) • Flexible service delivery (F)	• Patients being connected to the rural community (F)

Author, Year	Jurisdiction	Model	Macro-level factors	Meso-level factors	Micro-level factors
			• Supporting rural RNs to gain NP licensure (F) • Addressing issues of role isolation (F)		
Hutchison & Glazier, 2013	ON	CHC	• Lack of collaboration between providers (B) • Lack of a common voice (B) • Lack of resource and expertise sharing (B) • Quality improvement training and support across the entire sector (F) • Limited electronic health record (EHR) interoperability and performance measurement (B) • Limited disease management and registry capability (B)	NA	NA
Khan et al., 2022	ON	CHC	NA	• More years since practice establishment (F) • Quality improvement capabilities (F) • Large team size (B) • Use of centralized processes for administrative functions (i.e., referrals, patient enrollment) (F) • High level of information exchange (B) • Wide range of formal and informal mechanisms to share information across providers (F)	NA
Kristjansson et al., 2013	ON	CHC	NA	• Continuity of care (F)	NA
Lawson et al., 2012	NS	Enhanced collaborative care model	• Strong health authority and physician support (F) • Skills and working style of the NP (F) • Early proactive team-building activities (F) • Remuneration – physicians funded through an alternative payment plan instead of fee-for-service and the NP by the health authority (F)	NA	NA

Author, Year	Jurisdiction	Model	Macro-level factors	Meso-level factors	Micro-level factors
			• Widespread adaptation of this model of care will be challenging within traditional fee-for-service practice (B)		
Longmoore, 2013	SK, NS	CEC	• Education, resources and managerial oversight requirements (F/B) • Clear channels of authority and decision-making (F) • Role clarity (F) • Policies and procedures that support team members in meeting their individual standard of practice (F)	NA	NA
Lukewich et al., 2018	CA	CHC and NPLC are discussed	• Family practice nursing competencies (F) • Better interprofessional team functioning (F) • Role clarity and articulating scope of practice for registered nurses (RNs; F)	NA	NA
Lukey et al., 2021	BC, AB, ON, QC	Includes CHCs among other models	• Policies on patient-centred care (F/B) • Collaboration and co-creation of structures and processes with professional associations (F) • Province-wide information systems and compatibility with EHRs (F) • Fragmentation of health information (B) • Provider remuneration – physicians on fee-for-service (B)	• Team structure (F/B) • Infrastructure, such as co-location (F) • Ratio of non-physician team members to physician (F/B) • Lack of optimization for non-physician provider scope of practice (B) • Lack details on team member roles and responsibilities (B)	NA
Bourgeault & Mulvale, 2006	CA (+US)	Unspecified; comments on NPLC	• Regulatory factors – Acts and legislation (F/B) • Economic factors (e.g., coverage of services, funding, and remuneration models) (F/B)	NA	NA
Martin-Misener et al., 2004	NS	NPs in demonstration sites (1 urban, 3 rural)	• Lack of clarity about the role of the NP or pharmacists (B) • Lack of engagement with allied health professions or pharmacists (B) • Role of pharmacy (F) • No legislation to permit NPs to practice in Nova Scotia at the time (B)	• Physicians and pharmacists unclear of liability issues with working with NPs (B)	NA

Author, Year	Jurisdiction	Model	Macro-level factors	Meso-level factors	Micro-level factors
			• Lack of NPs practicing in Nova Scotia (B) • Recruitment to rural sites (B)		
Martin-Misener et al., 2019	BC, ON, NS	CHC and NPLC	• Legislation (F/B)	NA	NA
Misfeldt et al., 2017	BC, AB, SK	Primary care overall with some mention of NPLC and team-based clinics	NA - Provided descriptive information about model		
O'Rourke & Higuchi, 2016	ON	NPLC	• NP leadership (perseverance, risk-taking, effective communication) (F)	NA	NA
Rayner et al., 2018	ON	CHC (and others)	• Community governance (F)	NA	NA
Roots & MacDonald, 2014	BC	NPLC	• Poor remuneration mechanisms (B)	NA	• Patient satisfaction with care/appointments (F)
Russell et al., 2009	ON	Unspecified	NA	• Inclusion of NP on team (F) • Smaller patient to provider ratios (F)	NA
Sangster-Gormley et al., 2013	BC	NPLC	• Lack of long-term planning (B) • Community involvement (F/B) • Legislation governing provider scope of practice (B)	• Role clarity within the organization over provider scope of practice and responsibilities (B) • Time lags in leadership decision-making and direction (B) • Designated physical office space (B) • Team involvement in planning phase (B)	• Recognition of NP role and trust within team (F) • Prior knowledge of NP scope and role (F/B)
Sicotte et al., 2002	QC	CHC	• Role of professional training programs in fostering collaboration (F) • Community characteristics (F/B)	• Internal dynamics of teams (F/B) • Differences in ideologies between providers (B) • Role clarity among teams (B) • Traditional hierarchical relationships and role understandings (B)	NA
Whalen et al., 2018	NS	CEC	• Insufficient support from government, health authorities, and collaborating operations (B) • Lack of long-term planning (B)	• Differences in work culture and experience between professions (B) • Confidence among health providers to work independently (F/B) • Access to continuing education (B)	• Community and patient satisfaction with care (F)

Author, Year	Jurisdiction	Model	Macro-level factors	Meso-level factors	Micro-level factors
Wilson et al., 2021	BC	NPLC	• Community characteristics (e.g., number of unattached patients in the community, level of medical complexity) (F/B)	• Variation in team composition by workplace, with NPs taking on roles that are not fulfilled by other programs or structures (B) • Role clarity among teams (B) • Workplace structure not conducive to address access, continuity of care, or team-based care (B)	NA

Notes. (F) represents facilitators as described in the paper; (B) represents barriers as described in the paper; NA (Not available)

Appendix C. Interview Questions

Interview questions (V2: June 29, 2022); Reviewed and approved by the University of Toronto Research Ethics Board (#42947).

Role and experience

1. Describe your role in developing, implementing, and/or delivery of the [specify team-based primary care model]?
2. What was the main aim/primary objective of this model?
   (e.g., What does it aim to improve/what gap in care or support does it address?)

Mechanisms and enablers to improved team-based primary care & barriers/facilitators

1. Based on your experience, what factors have led/contributed to improved access to primary care in [specify team-based primary care model]?
   - *Probes: consider access, quality, and cultural safety*
   - *Consider micro, meso and macro level factors:*

     a) How have relationships/perceptions among team members, providers, patients or others influenced this?

     b) Team/organizational/institutional structures, partnerships, policies or processes?

     c) The broader health care system, policy and social context?

2. What barriers/challenges were faced when implementing this model? How might it impact potential spread or expansion of this model?

   - *Consider micro, meso and macro level factors:*

     d) How have relationships/perceptions among team members, providers, patients or others influenced this?

     e) Team/organizational/institutional structures, partnerships, policies or processes?

     f) The broader health care system, policy and social context?

3. *If involved in implementation:* What has contributed to its success or acted as a facilitator to the implementation of this model?

   If not involved in implementation: What has contributed to its ongoing success in terms of providing high quality accessible team-based primary care to their community.

   - *Consider micro, meso and macro level factors*
     (e.g., existing tools to support implementation, skills/expertise required for implementation, infrastructure)
   - Are there any core features or principles of the model that should not be modified? Adaptable features/principles that could be modified based on context?
4. How do you evaluate whether your practice/model meets your objectives/needs of the community and evaluate impact?

- Any infrastructure or processes that are (or would need to be) in place to collect, analyse and use data to evaluate impact?
- In what ways, if any, did you monitor the status of the model during different phases of implementation?
- Did this reveal any unintended consequences or additional considerations for safety, cost, effectiveness, or care experiences?

5. To what extent was this model developed or implemented in partnership with community, patients, and caregivers?
    - How do you engage patients/families, and/or community on an ongoing basis?
    - Probe: Were there any vulnerable groups that were specifically engaged, such as First Nations, Inuit, and/or Métis, 2SLGBTQIA+?

CLOSING

1. What are your priorities or focus for improving care access in the coming years?
    - How will this be done?
    - What are the enablers/opportunities (and respective barriers/challenges) to further spread this initiative, including potential willingness of innovators, jurisdictions/communities, and/or needs identified?

2. Is there anything else that would be important for us to know about [specify team-based primary care model]? *Ask participant to share resources.*

Appendix D. Case Summaries

Nurse Practitioner Clinics in Ontario

Background and objectives of the model

Ontario is unique in Canada in the extent to which they have implemented Nurse Practitioner-led Clinics (NPLC). These clinics allow Nurse Practitioners (NP) to operate autonomously as the most responsible provider, and as not-for-profit businesses They deliver comprehensive primary care to regions where care is difficult to access and where there are many unattached clients (53).

The first NPLC was established in Sudbury in 2007 led by a team of two NPs (53). In 2008, the Ministry of Health and Long-Term Care (MOHLTC) announced that it would be funding additional NPLCs, and over the next three years, released three calls for proposals—prioritizing those from communities of high need. These requests, in combination with significant interest from NPs, many of whom were intrigued by the idea of participating in innovative primary care, led to the establishment of twelve more NPLCs by 2010. NPLCs were attractive for many NPs in part because they provided an opportunity to work autonomously—rather than under a physician's supervision—and with an interprofessional team of other healthcare providers (i.e., dietitians, social workers, etc.). Although the Ministry has not released subsequent requests for proposals, there are now 25 NPLCs across Ontario, albeit that number was temporarily up to 26 (53).

The interprofessional nature of NPLCs helps serve vulnerable and marginalized populations (e.g., previously unattached patients) in several ways, as described by expert informants. First, the co-location of services saves time and improves care efficiency by providing in-house specialized care (i.e., dietitian services, COVID-19 vaccination clinics, etc.) which could otherwise be difficult to access, especially in the rural or remote communities where NPLCs are often located. It should be noted however, that NPLCs are not open to walk-ins and therefore individuals must be patients of the NPLC to access its services.

Experts noted that NPLCs in Ontario were introduced around the same time as the Family Health Team (FHT) model, and in their estimation, were intended to provide efficient interprofessional team-based care at a lower cost than physician-led models. Recent research shows wide variation in the total cost of physician-led primary care models (in terms of total health expenditures of their patients), with the most expensive being traditional fee-for-service models more expensive than team-based models (such as Family Health Teams) (54). Operationally, most NPs in Ontario, including those working in NPLCs, are salaried health professionals. Initially, the government provided NPLCs with sufficient funding for two NPs per clinic, though this was quickly increased to four, and now some NPLCs operate with as many as eight NPs. The ministry guidelines set a minimum target patient panel size of 800 patients per NP, with the average NP panel size in Canada ranging from 400-1100 (55). The provincial funding is also meant to cover the cost of four clinic administrators (one lead and three supports) and four interprofessional health care providers (i.e., dietitians, social workers, registered nurses, etc.) (53). Local experts also noted that even if not physically present at the clinic, each NPLC has a collaborating physician on-call if needed for a consultation.

NPLCs are governed by a Board of Directors consisting of a variety of health workers and community members. Experts noted that to ensure the clinic remains truly NP-led, the Board of Directors must

consist of at least 51% NPs—one of which is designated the "NP Clinic Lead" (53), though the absolute size of the board varies. In addition to directly caring for patients, the NP designated as "Clinic Lead" is responsible for managing clinic operations, community integration, quality assurance, governance support, etc. (53). Also, to minimize potential conflicts of interest, other than the NP Clinic Lead, none of the NPs on the board can be employed by the NPLC.

Implementation and sustainability barriers and facilitators

Receiving support from other healthcare providers in the region was reported as a key facilitator to establishing NPLCs. Experts reported that letters of recommendation or personal testimonials from members of the local hospital, long-term care homes, or other specialists were helpful to secure Ministry funding during the NPLC application process. Another facilitator involved seeking advice from other groups who had previously established NPLCs. For example, inquiring about which experts to hire (i.e., administrative assistants, business planners, computer experts, etc.) was noted to be beneficial. Prioritizing the recruitment of an interprofessional healthcare team—one of the key characteristics of team-based care—was another important facilitator to the successful implementation by helping to improve patients' satisfaction with the care they received.

There were several reported barriers to implementation that related to funding. First, since much of the NPLCs' implementation occurred shortly after the 2008 recession, many of these clinics faced significant resource limitations. Thus, they were forced to develop a highly streamlined care model, focused on supporting the most vulnerable individuals rather than the whole community. In addition, experts noted that these resource limitations also made it difficult to recruit enough team members to small clinics, since many potential recruits would choose to work in environments where they could make more money (e.g., large urban hospitals).

While NPs can address most of the population's primary care needs under usual circumstances, efforts continue to be made to expand their scope of practice to improve access to care for patients served by NPLCs. Recent examples include the changes implemented by the Ministry on July 1, 2022, whereby NPs are now authorized to order Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) scans, as well as perform point-of-care tests (e.g., urine dip) (56,57).

There were also role recognition-related barriers facing NPLCs. For example, in 2011, the Ministry funded group Healthcare Connect (HCC) implemented an incentive program whereby they would pay FPs a one-time payment for each unattached patient they enrolled through HCC (58), but NPs were not eligible to receive this payment. Though there are some barriers, there has been increased acceptance in the health system of NPs as primary care providers. For example, during their intake to hospitals, patients are now asked the name of their FP or NP, rather than only their FP. This means that NPs now also receive patient hospital reports, allowing for improved continuity of care between hospitals and NPLCs.

Experts also reported that in the past, many physician specialists would not accept referrals for patient consultations from NPs because they could not bill the Ontario Health Insurance Plan (OHIP) unless the referral came from a physician. As of May 1, 2015, however, this is no longer the case—specialists can now bill for both NP and physician referrals (59). Some insurance companies, however, still require a physician's signature to honour insurance claims for prescriptions written by NPs (i.e., to obtain coverage for hearing aids in rural/remote regions of Ontario). The remaining differences in scope of

practice between NPs and physicians mean that NPLCs will likely always need to have a collaborating physician.

Evaluation

Experts noted that most NPLC evaluation is currently centered around documents and quarterly reports that must be submitted to the Ministry (e.g., schedule A, annual operating plans). These reports are intended to describe the NPLCs' targets and if/how they were met. For example, each year the Ministry of Health sets out priority indicators for quality improvement plans; indicators cover aspects related to patient experience (e.g., involvement in decision making), safe and effective care (e.g., opioid prescribing in primary care), and timely transitions (e.g., follow-ups with patients discharged from hospital, referrals, and health screening). Each health organization will set targets for these indicators (60). In some cases, the Ministry reportedly shares the aggregate data with the NPLCs.

Other evaluation strategies used by some NPLCs include conducting routine patient satisfaction surveys and tracking metrics such as reductions in the number of local emergency department (ED) visits or the average annual cost per patient. One expert reported that NPLCs could treat patients for approximately $400/year on average—demonstrating efficient care considering that the average hospital cost for a single ED visit in Canada was $304 in 2019 (61).

Participants reported a significant gap in data access for evaluating NPLCs. Unlike physicians, provincial policies do not allow NPs to formally roster their patients, thereby resulting in a lack of billing data and making it difficult to track the number of patients are seen by NPs. Moreover, since patients enrolled by NPs technically remain 'unattached' since they are enrolled in the NPLC but not rostered by any specific NP, it can be challenging to collect the patient-level data required to assess health outcomes. At the local level, some NPLCs attempt to mitigate this issue by using quality improvement specialists who work to build a narrative around impact and demonstrate the benefits of NPLCs. Experts also suggested that a more macro approach (i.e., working with groups such as the Alliance for Healthier Communities) could be useful for developing a strategy to link data between individual NPLCs into a more robust provincial data system.

Community involvement

Local communities were highly connected to NPLCs in Ontario from the start of implementation. Although the provincial government was primarily involved in choosing where NPLCs would be located—they decided which proposals to accept, letters of support from community members were integral to the application. Moreover, once communities were granted a clinic, their support was integral to its success. Experts reported that community support included donating the physical space to house the clinics, organizing fundraising events to raise capital, and recruitment tactics such offering free golf memberships to prospective NPLC team members. As part of NPLC boards, community members were also involved in its governance and key decision-making processes to help ensure the NPLCs met the specific needs of each community. This community involvement was noted as being especially important in the late 2000s and early 2010s when many NPLCs were first established—given their limited resources following the 2008 recession—to ensure that vulnerable and marginalized populations were cared for.

Priorities moving forward

Experts noted several challenges that NPLCs face in terms of their continued success and expansion. NPLCs often have difficulty obtaining additional government funding because few NPs have been able to reach the minimum number of patients (i.e., 800) set by the ministry as an indicator of positive impact—in large part due to resource limitations and the time required to care for patients with complex needs. Therefore, amending provincial policies to allow for NP patient rostering was reported as a priority moving forward, as this would facilitate the collection of patient-level data and may help address concerns regarding NP patient enrollment and overall NPLC impact.

Another important focal point noted by experts was to continue expanding the reach of NPLCs. First, there is a need to establish more clinics—particularly in communities of high need. This can, at least in part, be accomplished by advocating for more flexible funding models to allow for the hiring of additional NPs. More clearly and transparently defining the NPLC application process will also be beneficial. Second, participants expressed a need to increase the number of seats in NP-training programs. Third, increasing NPLC reach will involve placing continued emphasis on local community outreach programs geared at improving access for individuals who may not otherwise seek it out. For example, the use of virtual care can be a highly beneficial tool for reaching certain patient populations, as is evidenced by the virtual care explosion throughout the COVID-19 pandemic. However, it is does have limitations, including outstanding accessibility issues and capacity issues caused by "double dipping"—when patients book both on-line and in-person appointments.

Nurse Practitioner Involved Clinics in Saskatchewan

Background and objectives of the model

While NPLCs are mainly found in Ontario, NPs also play a significant role in Saskatchewan's team-based primary care landscape. Some NPs in the province have a narrow and specialized focus of practice (i.e., long-term care homes, emergent care settings, other specialized practices, etc.), but most NPs work in primary care settings (62)—often those that emphasize collaborative, team-based care. Local experts reported that, contrary to the NPs in Ontario—which were directly involved in the implementation and establishment of NPLCs, NPs in Saskatchewan usually join existing physician-led practices where they then work full-time and have the autonomy to implement changes as they saw fit (e.g., adjust schedules and clinic hours).

The objective of these NP-involved clinics is to improve access to comprehensive care, especially in rural or remote communities (e.g., First Nations communities). They also commonly served large geographic areas and communities with transient populations (e.g., seasonal workers). For these reasons, the clinics often prioritized same-day care because requiring patients to schedule appointments in advance was a significant barrier to access given that many did not have reliable transportation to and from a nearby clinic.

Implementation and sustainability barriers and facilitators

Having a well-balanced team was a commonly reported enabler of high-quality care, especially considering that most NP-involved clinics are in rural and remote areas where patient needs vary significantly between communities. Strong administrative and management support was considered important. However, experts also reported challenges with recruitment of retention of team members. They reported having particular difficulty recruiting physiotherapy, occupational therapy, and mental health services providers. In terms of NP recruitment, some clinics have tried offering relocation bonuses, but were often still unable to retain NPs long term. For example, it was noted that NP's spouses may have difficulty finding employment in the communities in which the clinics are located.

Appropriate infrastructure (i.e., an adequate number of examination rooms) also greatly facilitated the clinics' abilities to provide team-based care. Co-location of services was reported as highly beneficial characteristic because it helped ensure timely access to the most appropriate services for all patients. This was especially important in communities located far from urban centers where few individuals were willing to commute long distances for said services.

Other reported facilitators included following a patient-centered approach; and conducting monthly team meetings to discuss what worked well and what did not—allowing providers and staff to feel as though their concerns were being heard. Experts also noted a policy that required clients to be listed as patients of individual providers rather than of the clinic was a barrier to the effective functioning as a care team, a challenge that was particularly problematic when a provider retired or left their position. To mitigate this issue, some experts reported coupling patients to two providers—in many cases an NP and a physician.

Recognition of the NP role was reported as a key factor that would support the implementation of NPs into team-based primary care environments. When members of the clinic leadership team were not

seen to fully understand the NP role, experts noted that it was difficult for NPs to exercise their full scope of practice (which is among the broadest in Canada [60]). One proposed solution was to encourage NPs to take a leadership role in the implementation of clinics, as is the case with NPLCs in Ontario. Another possible barrier to NPs working to their full scope is the fact that some private insurance companies still will not accept an NPs referral for physical therapy or medical equipment (64).

Evaluation

Local experts were not aware of any formal assessment or evaluation of the role of NPs in team-based primary care clinics. Whether the clinics are meeting their objectives is usually based on direct patient feedback (i.e., reports of satisfaction) or other metrics such as an increase in the number of patients interested in receiving care from NPs. Additionally, one expert noted that by switching to a walk-in model—where no appointment is required—on the weekends, their clinic had been able to successfully reduce the number of patients visiting nearby emergency departments.

Local experts also noted that periodic external evaluations of NP involvement are performed, pointing to a recently conducted survey by the Saskatchewan Association of Nurse Practitioners (SANP). This survey found that nearly 45% of responding NPs felt they were being underused—10% of which were unable to find employment at all (65,66).

Community involvement

At the governance level, experts reported that most NPs work in clinics managed by the Saskatchewan Health Authority with very little, if any, community involvement. They felt that this occasionally made it difficult to truly understand and support the needs of specific communities, which is critical when providing care to rural and remote regions where patients' needs may differ significantly from one community to the next. However, they also noted that community members were very supportive of the clinics and highly involved in the advocacy side of things. For example, community members would often petition their local MP to recruit additional NPs.

Priorities moving forward

When asked about priorities for the future, experts agreed that the primary objective should be to move toward implementing true NPLCs like has been done in Ontario. Doing so will require further improvements regarding NP role recognition, facilitating their ability to operate autonomously from physicians. For example, some insurance companies still require a physician's co-signature before honouring certain insurance claims, though this is much less common than in the past.

In addition, experts expressed their belief that continued support from physician colleagues will help to improve NP recognition, in turn increasing overall recognition and support for the NPLC model. Finally, establishing NPLCs will also require improved recruitment and retention strategies for NPs and other interprofessional team members. Some proposed strategies include offering incentives such as guaranteed employment for registered nurses (RN) after they complete the two-year master's program required to become an NP; or paying providers for their commute times.

Community Health Centres in Ontario

Background and objectives of the model

Community Health Centres (CHC) were introduced in Ontario as pilot projects in the early 1970s and now exist in over 101 locations in Ontario (67). CHCs aim to serve particular subsets of the population, such as individuals from lower income neighborhoods, newcomers to Canada, people who receive social assistance, and those with complex health needs (15). From 2006 to 2008, the number of CHCs in Ontario grew with the main objective of providing team-based care to areas where few people had access. CHCs in Ontario are community governed, unlike in other provinces such as British Columbia where many CHCs are managed directly by regional health authorities (68).

Implementation and sustainability barriers and facilitators

Local experts discussed system level facilitators to sustainability of CHCs including government support for the model, and alignment with a health equity approach. There also appears to be a growing emphasis and interest in building integrated networks and partnerships in Ontario, which appear to be supportive of team-based care models such as CHCs. At the organizational level, facilitators included the salary-based funding model for providers, which appeared to be desirable for some providers. On the other hand, local experts mentioned that funding mechanisms for physicians (e.g., salary instead of fee-for-service) tended to be a barrier to recruitment and hiring in CHCs.

Local experts also discussed several barriers to implementation and sustainability. At the health system level, barriers included pushback and advocacy against CHCs from professional physician groups, such as the Ontario Medical Association. There were some differences in how local experts described the role of local rural physicians in implementing CHCs. Some local experts felt that rural physicians were not supportive of local CHCs since physicians often had large patient rosters, which are tied to funding, and may have felt that CHCs would take their patients. Others, however, felt that some rural physicians saw the potential for CHCs to address the complex health needs of community members.

Evaluation

Several evaluations of CHCs in Ontario have been carried out by various research groups and organizations. In 2016, Glazier et al. used health care data to compare the effectiveness of CHCs and other primary care models for improving access to care, reducing emergency visits, and managing chronic conditions (15). They found that CHCs had similar trends in emergency department visits, hospital admissions, and specialists visits as other primary care models. The Ontario Auditor General also performed a review of CHCs in 2016 and 2017 and concluded concerns about physician compensation models with respect to cost control, as well as a lack of accountability mechanisms and oversight by the Ontario Minister of Health and Local Health Integrated Networks. More recently, in 2020, the McMaster Health Forum conducted a rapid synthesis aimed at identifying key features of CHCs and the impacts of CHCs on improving health outcomes and associated costs. While not specific to Ontario, their literature review found that CHCs enhanced patient experiences, helped address health equity issues, and perceptions among staff that CHCs created a supportive work environment with shared values of advocacy (69).

When asked about evaluation metrics for CHCs, local experts discussed several accountability indicators and performance indicators in place in Ontario. For example, each CHC is responsible for setting targets for improvements and reporting quarterly results to Ontario Health. Local experts mentioned that performance indicators are tied to funding, where there are financial cuts for CHCs that do not meet targets. In terms of data reporting, prior to 2008, CHCs reported information directly to the Ministry where local CHCs did not have control over their data. In 2008, CHCs took responsibility and control of their data and were financially responsible for setting up infrastructure and budgets to support data management, which was part of their global operating budgets. While this change allowed CHCs to perform better program monitoring and better communication between CHCs that were in close proximity, local experts reported that these changes created some challenges with having enough funds to develop data management infrastructure.

Community Involvement

Local experts were asked about the role of communities in the development, implementation, and sustainability of CHCs. Local experts stated that local community members are often involved in the early stages and advocate for CHCs to become part of their communities. Local community advocacy groups have helped attract funding and planning of CHCs in their communities at times when the Ministry of Health announced expansion.

In terms of community governance, local experts emphasized that CHC Boards should, and often do, include representatives with different perspectives, including individuals who are part of marginalized groups. As examples, local experts reported the importance of having representation from French speakers and individuals who identify as LGBTQIA+ on boards. In addition to CHC Boards, some CHCs in Ontario also have client advisory councils or committees. The goal of these committees is to provide feedback to their local CHC Board on proposed or planned initiatives or evaluations. Client advisory council or committee members often comprise non-board members, such as primarily clients, participants in programs, or family members of individuals receiving services in these CHCs (70,71).

Priorities moving forward

When asked about future priorities for CHCs in Ontario, local experts discussed three initiatives: collection of socio-demographic data, expanding access to team-based care, and sustaining the CHC model. Currently CHCs are undertaking work to collect socio-demographic data to tailor services to ensure a broad coverage of care and minimize disparities in access and health outcomes. Local experts discussed that current efforts to expand access to team-based care are being challenged by staffing issues where some healthcare providers prefer to work in hospitals over CHCs because they receive higher compensation. Finally, local experts brought up concerns with the potential for proposed health system arrangements, such as hospital hubs or rural health hubs, to take over or challenge the organization and structure of CHCs (72). For example, it was felt that rural health hubs or hospital hubs could lead to a more a provider-centric model of care and there could be threats to the community-governance approach to CHCs.

Community Health Centres in British Columbia

Background and Objectives of the Model

In British Columbia (BC), there are five geography-based health authorities, one provincial health authority, and the First Nations Health Authority (73). In terms of CHCs, there are two types operating in BC. These include the traditional CHC model, described as community-governed and independent from regional health authorities, and a community centre model, which is managed and operated by the local health authorities. There are approximately 30 community-governed and 100 health authority-run CHCs in BC (74). Historically, local experts discussed that the development of CHCs has been driven by community needs.

In May 2018, the Ministry of Health announced strategic funding for CHCs along with other primary care initiatives that focused on team-based care across British Columbia (75). As part of this announcement, the Ministry of Health brought together various stakeholders to develop a provincial CHC policy framework (76). Stakeholders included the BC Rural Health Network, BC Health Coalition and BC Association of Community Health Centres. The policy set out a definition and a guide for how CHCs could be implemented in communities and was reported by local experts as a resource to support the development of CHCs in communities.

In their 2018 announcement, the Ministry stated that the intended purpose of CHCs was to "bring together health and broader social services to improve access to health promotion, preventative care and ongoing services"; however, some local experts expressed concerns that there still does not appear to be a clear policy objective for CHCs from the Ministry. In addition, local experts noted that CHCs received lower funding priority compared to other primary care initiatives, such as urgent and primary care clinics. When asked about the objectives of CHCs, some experts perceived CHCs as a model of team-based care that takes the burden off FPs.

Implementation and sustainability barriers and facilitators

Local experts noted that developing CHCs locally can be a large, potentially overwhelming, undertaking for some communities. Some suggested that the description and requirements around community governance should be flexible and should gradually evolve in each community as their CHCs continue to develop and expand. They further emphasized that rigid definitions for community governance (e.g., community duties) and policies with multiple requirements could deter some communities from moving forward with CHCs implementation in their community.

There were several reported barriers related to preferences and concerns among health care providers. For example, some highly functioning clinics in rural communities included practitioners who did not want to adopt a community-governed model and preferred to maintain the status quo. Other reported barriers included concerns among physicians with changing remuneration methods from fee-for-service to salary, as well as comfort with physicians with moving from a physician-run practice as an employer to being an employee of a CHC.

Local experts raised concerns with the limited global budget availability for growing health clinics across communities in British Columbia. The lack of flexible funding appeared to impact the ability of CHCs to form partnerships with organizations and community agencies that could address issues with access to

care. Experts also noted that government support and funding is needed to help communities build capacity to develop new CHCs. More broadly, some local experts expressed that barriers to implementation could stem from decision-making structures in government. At the ministry-level, experts expressed a concern that decision-making committees tend to comprise the same small group of actors with little input from communities.

Evaluation

Local experts were not aware of any specific reports on evaluation metrics or assessments of CHCs in British Columbia. However, some provided recommendations on aspects to include when evaluating CHCs. Outcome-based evaluations such as assessing changes in the number of people who lacked access to primary care and finer details about why certain groups do not have access to care, were considered important. One expert highlighted the importance of supporting CHCs to use data to improve governance and patient/community engagement—similar to what is being done in Ontario by the Alliance for Healthier Communities and Health Quality Ontario; however, they also noted the minimal infrastructure available to do so in BC. There were also some suggestions that evaluations should assess whether CHCs have reduced inequalities as this was considered one of the objectives of introducing CHCs in some communities. Other local experts mentioned that evaluations should include a core group of individuals who express interest and are committed to improving the health of community members. This was to ensure that evaluations produce meaningful and relevant results.

Community involvement

Meaningful community engagement at the development stage was considered important for successful implementation of CHCs. It was reported that each rural community has different needs, and that since communities are aware of their health needs, they should be involved in development discussions. However, some local experts expressed that the lack of Ministry policies and protocols on community engagement often resulted in the use of a more tokenistic approach. Some local experts pointed to international examples of guidance for community engagement (77), and suggested that such resources be developed to help governments and communities plan for CHCs. In addition, local experts discussed that, prior to the development stage, community outreach and education should occur to help inform residents on how CHCs could benefit their own communities and to garner support to advocate for funding. Local experts also mentioned the importance of reaching a wide range of interest groups in the community. It was noted that community health tables comprised of a core group of stakeholders (e.g., health care providers, representatives from town council, seniors' advocates, and/or members of community or family services) in the community had helped prioritize health issues in communities (78).

Priorities moving forward

Local experts mentioned several different priority areas for CHCs in the future. Since experts expressed that CHCs should be community governed, it was recommended that CHCs should be developed alongside community development approaches. One local expert mentioned the Indigenous Services Canada Indigenous Community Development National Strategy that aims to build and invest in effective and sustainable communities as a useful resource for CHCs (79). It was also mentioned that governments would need to commit funding and allow time for CHCs to gradually develop in previously under-resourced communities.

Some local experts offered suggestions on how local community members could be better utilized, which could help address prior issues with the lack of human resources in rural and remote communities. For example, it was suggested that CHCs could train community members to perform delegated health care services within CHCs. Finally, one expert suggested the use of virtual care to expand primary care and specialist referrals and consultations to communities that often do not have regular specialists. In some parts of British Columbia, certain FPs have partnered with the BC Rural Coordination Centre, which offers a pathway for residents in rural and remote communities to meet with and consult specialists (80).

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