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Virtual care as deployed to improve access to primary health care in three Canadian provinces: a policy focused qualitative study

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Abstract

Background As the COVID-19 pandemic accelerated the uptake of virtual primary care (VPC) in Canada, debates over how it ought to be encouraged or discouraged, governed and paid for have intensified. Within these debates there has been little attention paid to the details of which technologies are being deployed to deliver VPC and how those technologies interact with non-technical factors to ensure efficiency and effectiveness.

Methods The aims of the study included drawing out pragmatic considerations for policy makers by identifying the various constellations of VPC technology that are being deployed; characterizing how key informants see them working and to what purpose; and describing how those technologies are interacting with non-technical factors to shape success. 29 qualitative interviews were conducted with mid-level VPC experts from the provinces of Alberta, Nova Scotia, and Ontario.

Results Key informants saw a broad range of VPC technologies as improving access to primary care by increasing efficiency and coordination. They deployed VPC to improve the accessibility, availability, and accommodativeness of care. They described VPC technologies interacting with and relying on: human efforts, funding models, and the institutional contexts for their success.

Conclusions Policy-makers seeking to optimize VPC will want to consider ways to support not just purchases of technology, but: the human effort required to choose and manage technology; the funding mechanisms that incentivize the efficient use technology; and the institutional contexts and cultures that underpin access improvements through technology.

Keywords Virtual care, Primary care, Primary health care, Access, Accessibility, Availability, Accommodation

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Introduction

Spurred by technological developments and the COVID-19 pandemic, Virtual Care (VC) has emerged in policy discussions and scholarly debates as a method for improving Canadians' access to Primary Health Care (PHC) [1–6]. Indeed, it is argued that VC has progressed from being an emergency measure brought in to support pandemic care, to being a core part of how PHC is delivered [7]. As this has happened, and the accustomed patchwork of provincial approaches to supporting it have emerged, so too have debates over how VC ought to be encouraged or discouraged, governed and paid for [8–10]. Within this charged context, VC can be defined as any remotely conducted, and thus technology-mediated, interaction between a provider and patient [11–16]. Perhaps because the definition is so broad, there has been little attention paid to the details of how VC is being deployed, and how specifically those deployments of technology interact with non-technical factors. This in turn has created blind spots for policy makers and system actors when it comes to knowing about and seeking to scale (or not scale) VC interventions to improve access.

The present paper draws on interviews with key informants in the Canadian primary care systems of Alberta, Nova Scotia, and Ontario to describe the thinking, technologies, and non-technical factors affecting how mid-level experts (MLEs) are using VC to improve access. We illustrate the links MLEs make between efficiency or coordination gains and access improvement, and show the diverse ways in which they are implementing a range of VC technologies to improve three specific dimensions of access. We then highlight how MLEs perceive the non-technical aspects of VC implementation – the human effort, funding mechanisms, and institutional contexts – that they see as entwined with and central to the success of the technical aspects of VC. We discuss the policy implications of these findings and recommend particular areas of attention to decision makers.

Background

Access to healthcare is a foundational priority of the Canada Health Act of 1985, and specific access to PHC, or at least physician-provided primary care [17], has been 'in' the *Medicare* basket since its inception [18]. Despite this prioritization, ensuring Canadians have access to PHC has long proved problematic [17, 19–21] with those challenges extending across the five key dimensions of access as identified defined in the literature: *availability*, *accessibility*, *affordability*, *accommodative capacity*, and *acceptability* [22, 23]. The availability dimension of access refers to the presence of healthcare professionals to provide service. Accessibility refers to the ease, or difficulty, that patients encounter in meeting with those professionals. Affordability refers to patients' capacities to pay for the professional services and other aspects of a health system. Accommodative capacity is the ability

that healthcare professionals and their institutions have to provide care that is well adapted to the lives and needs of patients. Acceptability refers to whether and how patients trust and feel comfortable with the healthcare professionals and services that are available to them.

The present crisis in access to PHC has been viewed predominantly through the rhetorical and policy solution lenses of physician *availability* and *accessibility*. Indeed, the crisis has come to be defined by an *availability* gap involving somewhere between 5.4 and 6.5 million Canadians who are *unattached* to a family physician (FP) [24–26]. Policy responses have included new primary care-focused medical schools [27–30] and increased capacities at existing schools [31], as well as finance reform [32]. As we show, availability and accessibility remain central foci for those putting VC into practice, with accommodative capacity also appearing in their thinking and work.

As the use of VC has expanded the literature examining its deployment in PHC has focused on how remote delivery affects relational continuity and care comprehensiveness [33–36], as well as the implications of using privately owned technology systems [9] and under what circumstances VC is an appropriate choice inside the therapeutic relationship [16, 37, 38]. The present study contributes to this literature and policy creation by exploring the perspectives of MLEs on how VC can improve access, and the technological and non-technical factors that shape the success and sustainability of their approaches to delivering VC.

Methods

Twenty-nine semi-structured [39, 40] interviews were conducted with twenty-five MLEs. MLEs are key informants [41, 42] who, in the present study's case, are embedded in the various provinces' primary care systems. They are subject-area experts with not only on-the-ground clinical, organizational or advocacy experience but also expertise at the level of organizational change, quality improvement and/or primary care policy reform. Participants were identified and approached using a purposive snowball sampling method [43], that took advantage of the research team's existing relationships in the three provinces.

A semi-structured interview guide was developed iteratively by AF and ML with the findings from background reading and already-completed interviews suggesting new or refined areas of inquiry. Interviews ranged from 22 to 88 min. Initially, participants took part in one-on-one interviews (21 participants in 21 interviews); or two-on-one interviews (four participants in two interviews) with AF. Subsequently, six participants took part in an additional one-on-one follow-up interview, for a total of 29 interviews conducted with 25 unique participants. All interviews were conducted virtually, via Zoom video calls. With participants' consent, the interviews were digitally recorded to allow verbatim transcription and analysis. AF also took extensive notes during the interviews. Below,

we summarize passages from the transcripts to support our analysis, attributing the responses to participant numbers 001 to 025 in Table 1. Table 1 also includes the original quotes from which the summary passages were generated.

In choosing to recruit MLEs we aimed to improve both research efficiency, and effectiveness. In terms of efficiency, interviews focused on a smaller number of content specialists with views both ‘upward’ into broader systems, and ‘downward’ into clinical operations, are likely to attain adequate information power [44]. Ensuring our interviews were of sufficient length and quality we were able to achieve data saturation as rapidly as possible with a relatively small sample size [45]. In terms of effectiveness, MLEs’ dual-level experience of system politics and clinical pragmatics is invaluable in identifying actionable policy issues and reforms. Participants were asked to confirm, or deny, the appropriateness and relevancy of these purposive sampling choices at the end of each interview. All agreed that the choices were appropriate, efficient, and effective.

Data analysis followed an Interpretive Description approach [46]. This approach to qualitative research involves a continuous, interactional relationship between data collection and analysis, where fieldnotes and observations during data collection shape subsequent data collection and provide context to the data analysis process. Supported by MAXQDA software [47], we used an iterative coding approach [48] to developing a thematic, interpretive description [43] of how VC is being thought about and deployed to improve access, as well as draw out policy considerations related to scaling those deployments.

Findings

Our analysis revealed three themes in how MLEs were thinking about VC as a technical intervention to improve access, and a further three themes related to the non-technical factors they saw as surrounding and enabling the effective deployment of VC. Within the technical themes, we identified (1) ‘efficiency’ as a key concept through which MLEs operationalized the broader notion of access improvement; noting that in pursuing efficiency, (2) participants deployed multi-modal technologies to achieve gains across the accessibility, availability, and accommodative capacity dimensions of access; while also improving (3) coordination amongst care team members. Within the non-technical themes, we identified the importance of (4) human efforts and relationships outside of technology; as well as (5) the funding environment; and (6) the institutional context in which VC technology was being deployed as key factors in achieving efficiency and so improving access.

Thinking about VC: access improvement through greater efficiency

VC was broadly seen by MLE participants as a tool for improving access. A Nova Scotian FP who headed up a

geographically based care provision and administration zone crystalized this shared thinking (T1Q1; T1Q2). In making this broad idea of ‘improved access’ real, the MLEs spoke of VC as a specific technical activity that improved efficiency. 13/25 MLEs – including 7 FPs, 2 provincial and regional executives, 1 project manager, 1 recruiter, 1 health informatics subject matter expert and 1 nurse manager – explicitly linked VC to efficiency gains which in turn bolstered access by freeing up the time of individual providers. An FP who acted as medical director for a capitation-funded meso-level primary care organization serving FFS-funded ‘member’ physicians in Alberta expressed this widely shared perspective (T1Q3). These efficiency gains were realized through a range of modes of implementing VC, and led to improvements in three key dimensions of access: accessibility, availability, and accommodative capacity.

VC technology implementation: multi-modal efficiency-improvement, multi-dimensional access-improvement

An Ontario-based FP, practicing in a capitation-funded clinic, provided a more detailed explanation of the role VC technology modes – including and beyond using the telephone – played in increasing efficiency and so improving access. For them, improving efficiency by bridging distance with technology was essential not just to reaching isolated patients, but compensating for the uneven supply of care created by physicians’ preferences when it comes to geographic location and working hours (T1Q4). In doing so, the MLE links efficiency to access improvements across three of the concept’s key dimensions: *accessibility*, *availability*, and *accommodation*.

The specific technologies that this MLE and their clinic used to bridge *accessibility* distances, liberate physician *availability*, and *accommodate* the temporal care needs of their patients were: telephone, secure messaging and Electronic Medical Records. In alignment with another Ontario-based FP who held an executive leadership position at a provincial agency (T1Q5) the previous MLE described how they implement the second of these technologies – secure asynchronous messaging – as a step change in accommodating both patients’ temporal needs and physician’s work hour preferences (T1Q6).

The previously quoted MLE from an Alberta-based meso-level organization supporting FFS-funded FPs had built a fully virtual team of nurses delivering care to those FPs’ patients by not just secure messaging but phone and video calls. Initially travelling directly to member-FP clinics, a pandemic-induced move to fully remote delivery had realized massive efficiency gains as the same team of nurses could now see 40–50% more patients (T1Q7; T1Q8). Alongside these increases in the *availability* and *accessibility* of care, the virtualization of the nursing team improved their *accommodative capacity* by decreasing transportation distances, time and costs and, to the

organization's benefit, no-show rates (T1Q9). This access improvement could also be seen in the implementation of VC to more efficiently coordinate care.

VC technology implementation: access improvement through better coordination

Nova Scotian MLEs described using virtual teams to coordinate care and improve access for patients on the province's PHC waiting list. These otherwise 'unattached' patients are invited to register and then receive care virtually with a nurse practitioner (NP) or FP. With the system-assigned NP or FP becoming the designated PHC provider, the now-attached patient can book future virtual appointments through the province's online health information platform. For their part, the designated provider is able to refer their virtual patient for in-person appointments if those become necessary (T1Q10).

If VC done as telephone-only work was about a single FP managing a "stable of specialists" (T1Q11), it could also be more sophisticated and team-oriented. Two MLEs from Ontario described blending video conferencing and health information systems to create and coordinate care teams. These video calls advance the *accessibility* and *availability* of specialist providers either to otherwise isolated FPs, as they manage multimorbid patients (T1Q12), or to patients themselves in the form of poly-appointment case conferences in which a whole team of care providers – specialists, social workers, pharmacists and nurse coordinators – are brought into the patient's home via VC technologies (T1Q13).

[might be worth signalling that here is a shift from technical to non-technical factors...]

Non-technical factors: human effort underpins access gains

Along with describing how they leveraged a range of VC modalities to improve *accessibility*, *availability*, and *accommodative capacity*, the MLEs took pains to emphasize that these access gains were not merely technological accomplishments. The relationship and informational pre- and post-work conducted by nurse coordinators organizing VC case meetings (T1Q14) were described as a "special sauce" that ensured success and highlighted how these interventions are more than just video calls or secure messages (T1Q15). Similarly, MLEs' professional networks, social capital, and their time spent assembling teams of specialists (T1Q16) are both important to, and no guarantee of, a VC intervention's success (T1Q17). In addition to these non-technological human factors, funding model and institutional context factors were also seen as underpinning various access improvements.

Non-technical factors: funding underpins access gains

MLEs drew attention to how FPs' appetites for VC efficiency, and so access improvement, were shaped by

funding models. Two FP participants in 2 different provinces who were paid through capitation, not FFS, specifically emphasized how their clinics' funding models incentivized efficiency and so helped improve access. The first described how their Ontario clinic's capitated funding model incentivised secure messaging over phone calls, gaining *accommodation* efficiencies from asynchronous communication as neither patient nor physician were tied to a specific time (T1Q18). The second Albertan participant contrasted these gains with what they saw as the inherent *inefficiency* of FFS funding models incentivizing in-person appointments over what might otherwise be a short email (T1Q19).

A third participant from Alberta described how the efficiencies of the capitation-funded organization where they served as a leader could be in direct conflict with their member FPs' incentives to be *inefficient* under FFS. They described a situation where although a nurse on the capitation-funded team could, using VC, more efficiently work with a patient, member FPs would persist in scheduling less efficient in-person appointments to allow for FFS billing (T1Q20).

Outside of provincial decisions to follow capitation or FFS funding models, MLEs described the precariousness of individually financing teams-based VC interventions. In Ontario, the money to pay specialists attending FP- or patient-focused poly-appointment case conferences was found in "little pockets" at various provincial and municipal agencies (T1Q21). While the meso-level organizations in Alberta can build VC nursing teams using their capitation funding, the MLEs heading up the Ontario initiatives continue to look for consistent, long-term funding (T1Q22) and highlighted the inefficiency of their constant reapplications for support (T1Q23).

Non-technical factors: institutional context underpins access gains

In describing VC deployed to support team-based care, both the Alberta and Nova Scotia MLEs highlight the importance of not just funding, but institutional context in achieving access improvements. For one Alberta MLE, their meso-level organization's success was due in large part to early and ongoing supports for both VC and teamwork at the institutional level. Leaders at the organization had decided early on that VC would be necessary to meet patient demand and provide alternative avenues for access (T1Q24). The MLE noted that this early embrace of VC had underpinned significant access improvements during the pandemic lockdowns (T1Q25). Not only does this capitation-funded organization have an institutional track record of supporting VC and delegated teamwork, it specifically undertakes these activities to improve access (T1Q26). Similarly, a leader from the Nova Scotia health authority framed VC as a method for prioritizing patients and their access to care, even if private sector actors were looking to profit from it (T1Q27) (Table 1).

Table 1 Interview quotes referenced in findings

Quote #	Participant #	Quote
T1Q1	019	"I would say there's probably not a practice in Nova Scotia that doesn't use virtual care for attached patients. I think everyone's using it... we were doing phone calls way before COVID, so now they're considered virtual care appointments."
T1Q2	019	"Patient-centered care means that you want to be able to provide a basic level of care everywhere in the province, so no one's disadvantaged by the place that they live. And virtual care, I think, has allowed for that principle to be more accessible and realized."
T1Q3	023	"The role of virtual care most definitely has helped with efficiency."
T1Q4	012	"You will never have doctors distributed in a way that is commensurate with the public need... So providing care at a distance, as far as I can tell, is the only way around that... [and] even in areas where the supply of doctors is adequate, temporal access is poor."
T1Q5	013	"Secure messaging is an efficiency gain."
T1Q6	012	"Asynchronous messaging is next level of access, because you [as the physician are] not constrained to a timeframe."
T1Q7	015	"We've seen an increase in volume of care provided through the use [of] virtual care. I think the other side of that obviously, is increased access."
T1Q8	015	"I think we probably saw about somewhere between 40 to maybe 50% increase in the volume of... people that we were able to see because our nurses... weren't travelling from clinic to clinic and showing up to a clinic and maybe having people not show up to an appointment because they decided not to come in that day."
T1Q9	015	"Because people booked that appointment [themselves], they know it's going to work, it's going to fit in their calendar wherever they are."
T1Q10	019	"All patients in this province who put their name on our unattached registry get an invitation to register for virtual care in Nova Scotia. And once they register, they can go onto the [web]site, and click [that] they need to see a doctor. [From there] they get a [virtual] visit with a clinician, which could be a nurse practitioner or a family doctor."
T1Q11	004	"[I] have what I referred to as my 'stable of specialists,' and they were people that got to know me often just over the phone, and by the patients I sent to them, and the questions I asked them, but who then would respond to me in ways that were very helpful."
T1Q12	021	"[The VC intervention is] especially for family physicians who aren't part of teams. It enables them to... find the right specialist; to follow up on patients who are lost, [and help those patients] be connected to community resources and clinical pathways that they're [having] trouble connecting to... Family doctors talk about their lives pre and post [VC intervention and how] it's been a game changer for them."
T1Q13	021	"Everybody – psychiatrist, internist, social worker, pharmacist, case coordinator – [is] in the same room being beamed into [the patient's] home."
T1Q14	018	"[The nurse coordinators] do a lot of the groundwork with the patients in advance of the meeting. [They] really create a succinct summary so the [broader] team [convening on the call can] act [to] help the family doctor follow up."
T1Q15	021	"And the [special] sauce was really a nurse navigator who interviewed the patient, who unpacked the story, who organized the team-based consultation, who created the coordinated care plan and then stayed with the patient and family physician to actualize the recommendations for up to six months."
T1Q16	021	"These are people who have been specifically recruited, supported, embedded in [the VC intervention]. They're not a different person each time."
T1Q17	018	"When we ask [our connections] to participate in these things, they [can be] like: 'We don't have time. It's not aligned with what we need to do.'"
T1Q18	012	"I'm paid in a capitated model, so my financial incentive is to manage my patient's problems in the most efficient way possible... If I can do a message instead of a phone call and resolve their problem, that's preferable."
T1Q19	023	"What could just be a quick email in a very rudimentary fee-for-service clinic is always an in-person appointment, even if it's for one or two minutes... [Since] you need appointments, you're going to have to book them in because you need to bill a code."
T1Q20	015	"And so we're seeing some [member physicians in our organization who] are struggling to give up that [in person] care. Even though, for example, a nurse [on our VC team] can do things for a diabetic patient... A physician is choosing to [be available for that appointment], because they want to be able to have access [to the patient] for that billing. ... [Our team] can almost be too efficient for the physicians because we're starting to rob them of some of their opportunities to monetize those [FFS] patient encounters."
T1Q21	018	"We got line-item funding... these are all pigeonholes of funding in little pockets."
T1Q22	018	"It was good when [we] were trying to get things off the ground, but now we have to move to integrated funding because there's a lot of inefficiencies."
T1Q23	021	"So far it has been year-to-year. But it's been year-to-year for over a decade."
T1Q24	015	"As a PCN, we, in about 2017, started to work with our teams to really introduce the concept of adding virtual care to how they delivered care... And as [we] looked at the landscape, even not knowing what was going to happen in a couple of years [i.e. the pandemic], we knew that there'd be a need for more virtual care just to kind of meet patient demand and obviously meet their needs for more flexible care and access."

Table 1 (continued)

Quote #	Participant #	Quote
T1Q25	015	"And now that we're post pandemic-ish [sic], I guess, our model actually hasn't changed. We're still primarily virtual."
T1Q26	015	"Our philosophy is pretty simple. We really are here to meet the patient need first... [I]t is actually beneficial for the patient to have that choice [to see an in-person physician or the virtual PCN team] and to be able to access things the way that they need to."
T1Q27	019	"Right now, we have all these [non-health system] actors that want to make money from [VC] and we have to be clear, we just cannot do that. We have to make sure that whatever we choose is thoughtful, but also patient oriented."

Discussion

Although the use of telecommunications and information technologies to improve access to PHC predated the perturbations of COVID-19 [49, 50], the pandemic, along with advances in technology, pushed remote delivery into new spaces and uses [51–54]. What was once 'telemedicine' has been renamed and broadly defined as VC [55], and MLEs in the space think about VC as an efficiency and coordination driver, which also improves access to care.

The MLEs' accounts highlight how VC can not only improve the efficiency of individual FPs – helping them bridge distances, save time, and accommodate their own and their patients' schedules – but can also have even larger access-improving effects if deployed to support team-based care. Used to empower and coordinate PHC team members beyond the FP, VC is no longer confined to telephone work, with innovative approaches integrating electronic medical records and video calls with groups or individuals. Policymakers may wish to consider incentives for expanding these integrated, multi-platform efforts, including equipment and software subscription supports as well as adjustments to data use and privacy regulations where relevant.

Our data highlight the non-technical supports that allowed these legacy and new technological approaches to virtual delivery to flourish. Specifically, policymakers seeking to improve PHC access may wish to consider ways to ensure human efforts, funding models, and institutional contexts are well aligned with VC technologies. The sustainability of many of the innovations described above hinges on the social networks and social capital of the providers who convene the multi-disciplinary VC case conferences. Finding ways to systematize these relationships, rather than rely on individual relationships and favours given or owed, will be an important consideration going forward. Similarly attention will be well directed toward creating supports for the human effort required not just to convene, but to prepare providers and patients for VC sessions that are productive and efficient.

Here, funding models, as seen elsewhere in the literature, appear to be more or less encouraging to not just teamwork, but the effective use of VC [56, 57]. Finding ways to harmonize FFS-model features that incentivize physicians to convene in-person appointments with

the team-based efficiencies of capitation-funded nurses delivering care will be an important consideration. Relatedly, policy-makers seeking to expand the implementation of innovative VC platforms will want to incentivize institutional cultural supports that: inculcate true teamwork rather than "doctor with helpers" mental models [58]; demystify the technologies involved; and specifically link those technologies to efficiency, coordination, and access improvement in the thinking and practice of PHC team members.

As with all qualitative studies, our data offer a snapshot in time of technical and social activity happening in the VC space and from the perspective of our participant MLEs. Those perspectives – inevitably structured by personal, professional, and health system interests – will necessarily capture only part of the full range of access gains, losses or tensions that accrue from the adoption of a particular VC initiative. As examples, an initiative may improve access for one population (i.e. those with virtual access) while drawing an FP away from providing care to another; or it may introduce efficiency, care coordination and continuity challenges as patients move between virtual and in-person care while their records may not. Acknowledging these limitations, we have highlighted common cross-jurisdictional considerations and challenges to implementing VC in PHC. We have shown how MLEs are thinking about and pursuing access, efficiency, and coordination gains, with an analytic eye on guiding practice and policy development in other jurisdictions. While our findings may not be generalizable beyond the time and contexts in which they were gathered, and are necessarily specific and partial in their scope, the policy considerations we raise are intended to transcend the specifics and offer decision-makers in other single-payer contexts concrete options as VC advances in practice.

Conclusion

MLEs from the Alberta, Nova Scotia, and Ontario contexts, are deploying a range of VC services and technologies for efficiency and coordination gains and so improve three key aspects of access to PHC. In these efforts to improve accessibility, availability, and accommodative capacity, the MLEs are not just pushing beyond telephone work into multi-platform solutions, but also recognizing the importance of non-technical factors outside

novel implementation of new technologies. Policy-makers seeking to leverage VC will, as a result, want to consider ways to support not just purchases of technology, but: the human effort required to choose, manage, and implement technology; the funding mechanisms that incentivize the efficient use of VC; and the institutional contexts and cultures that underpin access improvements through technology.

Abbreviations

FFS	Fee-for-service
FP	Family physician
MLE	Mid-level expert
PCN	Primary care network
PHC	Primary health care
VC	Virtual care

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Authors' contributions

Leslie and Lavergne contributed to the conception of the study, Leslie designed the work with later assistance from Fleischmann. Fleischmann led the acquisition and analysis of data, while Fleischmann, Leslie and Lavergne collaborated on interpretation of data. Fleischmann and Leslie drafted the work and Lavergne contributed substantially to its revision.

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Data availability

It is not possible to share these research data publicly so as not to compromise the individual privacy of research participants.

Declarations

Ethics approval and consent to participate

This research received ethics approval (Certificate REB-2201385) from The University of Calgary Conjoint Health Research Ethics Board which observes the Tri-Council Policy on the ethical conduct of research involving humans. The Tri-Council Policy is aligned, and conforms, with the Helsinki Declaration. Each participant signed a Consent Form to indicate their consent to participate in research.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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