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ORIGINAL RESEARCH

Interprofessional teamwork innovations for primary health care practices and practitioners: evidence from a comparison of reform in three countries

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Context: A key aim of reforms to primary health care (PHC) in many countries has been to enhance interprofessional teamwork. However, the impact of these changes on practitioners has not been well understood.

Objective: To assess the impact of reform policies and interventions that have aimed to create or enhance teamwork on professional communication relationships, roles, and work satisfaction in PHC practices.

Design: Collaborative synthesis of 12 mixed methods studies.

Setting: Primary care practices undergoing transformational change in three countries: Australia, Canada, and the USA, including three Canadian provinces (Alberta, Ontario, and Quebec).

Methods: We conducted a synthesis and secondary analysis of 12 qualitative and quantitative studies conducted by the authors in order to understand the impacts and how they were influenced by local context.

Results: There was a diverse range of complex reforms seeking to foster interprofessional teamwork in the care of patients with chronic disease. The impact on communication and relationships between different professional groups, the roles of nursing and allied health services, and the expressed satisfaction of PHC providers with their work varied more within than between jurisdictions. These variations were associated with local contextual factors such as the size, power dynamics, leadership, and physical environment of the practice. Unintended consequences included deterioration of the work satisfaction of some team members and conflict between medical and nonmedical professional groups.

Conclusion: The variation in impacts can be understood to have arisen from the complexity of interprofessional dynamics at the practice level. The same characteristic could have both positive and negative influence on different aspects (eg, larger practice may have less capacity for adoption but more capacity to support interprofessional practice). Thus, the impacts are not entirely predictable and need to be monitored, and so that interventions can be adapted at the local level.

Keywords: interprofessional care, primary health care, teamwork, research synthesis

Introduction

Enhancing interprofessional team care has been a key element of primary health care (PHC) reform in many countries.[1,2] Team-related reforms have been built in the recognition that care is becoming increasingly complex for populations affected by multimorbidity and long-term physical and psychological conditions.

More comprehensive care can be provided by health professionals from multiple disciplines working together as a team.[3] Team-based care is also a critical element of the patient-centered medical home model.[4]

Interprofessional team-based care has been demonstrated to improve quality of care and outcomes in patients with chronic disease in primary care.[5–8] Teamwork may also reduce costs and improve care coordination for PHC organizations and enhance job satisfaction among health professionals.[9,10]

International surveys conducted by the Commonwealth Fund and other bodies have demonstrated considerable inter-country variability in the implementation of interprofessional team care in PHC.[11] However, the impacts of policies that aim to improve team care within PHC organizations have not been intensively studied, and the degree to which it is possible to transfer research into the implementation of teamwork across jurisdictional boundaries and contexts is unclear.

Interprofessional teamwork may be considered as "a dynamic process involving two or more health care professionals with complementary backgrounds and skills, sharing common health goals and exercising concerted, physical and mental effort in assessing, planning, or evaluating patient care."[12] This study aimed to describe how interventions and reform policies to enhance teamwork impacted on communication, relationships, role definition, and work satisfaction in PHC.

Methods

Our approach[13] draws upon the principles of participatory action research[14] and narrative, meta-narrative, and realist synthesis[15–17] using an open system approach.[18] Participatory action research seeks to integrate participatory interaction and the lived experience into the research process. In our approach, established investigators were brought together as active observers and participants in a deliberative iterative process of sharing, reflection, and synthesis. Deliberative process allows a group of participants to receive and exchange information, to critically examine an issue, and to come to consensus agreement. Specifically, an analytic-deliberative approach was used that combines technical and content expertise with the values and experiences and investigators. A distinctive feature of our approach is that a group of researchers from different contexts reflect together over a prolonged time frame to actively reinterpret findings from their own published research as well as raw data. In this way, the authors of original research papers become active participants in the process and use the collective studies of the collaborative group to explore and challenge each other's published findings, underlying assumptions, and personal experiential knowledge. The shared understandings that emerge draw on principles of realist evaluation to focus attention on ways in which contexts and mechanisms could be identified as impacting on study outcomes.

Ethical considerations

The original studies were conducted with the approval of the Ethics Committees of the authors' respective institutions. The synthesis work was approved by the Human Research Ethics Committee of the University of Monash University Human Ethics Committee (MHHREC CF10/1766-2010000910).

Participants

Investigators were brought together with the support of an international team Catalyst Grant: Primary and Community-Based Health Care from the Canadian Institutes of Health Research. Funding supported virtual and face-to-face engagement between 12 investigators. All the investigators were major contributors to primary care practice-based qualitative and quantitative studies from three countries (Australia, the USA, and Canada, including three Canadian provinces: Alberta, Ontario, and Quebec). The team comprised five academic family physicians, three sociologists, a medical anthropologist, a public health physician, and an epidemiologist. Three of the team had direct policy-making responsibilities. A total of 12 studies provided cross-jurisdictional comparisons of interventions on primary practices, practitioners, and patients. These interventions were either generated by changes in primary care policy or through controlled interventions. We drew upon published accounts and secondary reflection and analysis of primary data from each study to generate a cross-context synthesis of peer-reviewed manuscripts and additional unpublished data from 12 mixed methods studies (Table 1).

Analysis

The methodology involved four stages: 1) selecting, extracting, and classifying original published studies from each participant's program of research; 2) re-extracting and analyzing broader study materials and unpublished information from each study and program of research; 3) absorbing and reinterpreting knowledge from other studies that the investigators were aware of; and 4) reflecting and integrating insights from individual and group experiential reflections.

This iterative process of reviewing and synthesizing was accomplished using a combination of monthly teleconferences

Table 1 The studies

Study name	Study location	Catalyst investigator(s)	Study focus	Selected citations
Prevention and competing demands in primary care	Nebraska, USA	Crabtree BF, Miller WL	Ethnographic descriptive study of 18 practices to understand variation in quality of care	34
Using Learning Teams for Reflective Adaptation (ULTRA)	New Jersey and Pennsylvania, USA	Crabtree BF, Miller WL	Practice intervention in 56 primary care practices using facilitated team building and reflection to enhance quality of care	35
National Demonstration Project (NDP)	USA	Crabtree BF, Miller WL	Multimethod evaluation of the first major implementation of the Patient-Centered Medical Home in the USA among 36 family medicine practices	25,36,37
Strengthening PHC services through innovative practice networks	Alberta, Canada	Scott C	Three-phase program of research focusing on the impact of context and models of PHC on outcomes. Particular focus on establishment of interprofessional relationships	38
Behind the closed door. Using ethnography to understand family health teams	Ontario, Canada	Russell GM	Team formation and CDM in newly forming large primary care practices	39,40
Comparison of models of PHC in Ontario	Ontario, Canada	Hogg W, Russell GM,	Mixed methods evaluation of four primary care models in Ontario	41,42
Association of PHC service models with perceived health status, utilization of health services, ability for self-care, and perceived quality of services in patients with chronic disease	Québec, Canada	Levesque JF	Organizational models of PHC and their influence on health, utilization, and self-care for chronically ill patients	43
Accessibility and continuity of care: a study of PHC in Québec	Québec, Canada	Levesque JF	Organizational models of PHC and their influence on accessibility and experience of care users	44
Reorganizing the care of depression and related disorders in a primary care setting	Victoria and Tasmania, Australia	Gunn JM	Depression care in Australian general practice	45
Prac-Cap	Five Australian states and one territory	Harris MF	CDM and GP perspectives	46,47
Teamwork	Three Australian states	Harris MF	Cluster randomized trial of intervention to enhance interprofessional teamwork within 40 general practices	48,49
Teamlink: interprofessional teamwork between general practice and allied health services	Sydney, Australia	Harris MF	Quasi-experimental trial of facilitated teamwork between general practice and allied health services in 26 urban practices	24,50

Abbreviations: PHC, primary health care; CDM, chronic disease management; GP, general practitioner; Prac-Cap, practice capacity for chronic disease.

and four face-to-face retreats conducted between 2010 and 2012. The original broad aim was "To perform a synthesis of comparable studies to better understand the impact of primary health care reform on the organization, routines and relationships within primary care practices in different health care settings."[19] During the second stage, the focus shifted to a more specific question related to teamwork: "In what way do primary care reforms influence the development of teamwork in primary care practices."

With this focus, the participants went back to the published studies and reanalyzed the data, some of which was not necessarily published previously, to gain insights into the new research question. We used matrices to thematically arrange data on the implementation of teamwork innovations from each of the different studies. A context matrix involved three main sections: the broad organization of primary care in each setting (largely based on investigator's perceptions of the drivers of primary care reform and timing in each

setting); environmental and structural factors, drawn from a published conceptual framework for understanding the influences on primary care service delivery;[20] and a section related specifically to teamwork. We extracted data to inform the findings matrix through an iterative, emergent process. First, the lead investigator developed preliminary themes by grouping broad findings from a comprehensive, Ontario-based evaluation of multidisciplinary practices.[17] These categories were then used as a starting point for other investigators to extract key, relevant findings from their own studies and then refined as analysis progressed (Table S1). We considered the variation in these responses according to the intensity of teamwork involved, the existing organizational culture, decision-making processes, and the size and structure of the service. We used our meetings to explore and challenge each other's research findings and reflexively analyze how our findings were constructed.

There was variation between studies among the different jurisdictions. Thus, in our findings, we make reference to these jurisdictions (eg, Australia, USA, Alberta), although it is not necessarily the case that all the findings observed in the studies can be generalized across the whole jurisdiction (as they may not, eg, have covered all types of geographic areas).

Findings

There were major interventions and reforms implemented in all jurisdictions over the decade, which directly and indirectly aimed to enhance interprofessional teamwork (Table 2). As a result, there was evidence of changes in interprofessional processes of care both within PHC services and with health professionals outside of them. Improvements in interprofessional care processes included the following:

- Improved organization of chronic disease and preventive care (USA, Alberta, and Ontario)
- Increases in referral rates between clinicians (Australia)
- Patient-assessed quality of care (Australia)
- More frequent planned and guideline-based care for the management of chronic conditions (Australia, USA, Ontario, and Quebec).

The impacts on communication, relationships, roles, and work satisfaction were all variable within jurisdictions (Table 3).

Table 2 Changes to interprofessional teamwork studied in five jurisdictions

Jurisdictions	Studies	Interprofessional teamwork interventions or policies
Australia	Prac-Cap (2001–2004), Teamwork (2005–2008), Team-link (2006–2010), Reorder (2005–2007)	Enhanced primary care: funding episodes of care, interprofessional care plans, Medicare funding for allied health and psychological services
USA	P&CD (1997–1999), ULTRA (2002–2006), NDP (2006–2011)	Staff roles in preventive services delivery, quality improvement, learning teams, Patient-Centered Medical Home
Alberta	CoMPaIR (2007–2011)	Primary care networks: blended payments
Ontario	BCD (2007–2009)	Family health teams, increased capitated payments
Quebec	Primary care models (2005)	Family Medicine Groups: blended payments

Abbreviations: ULTRA, Using Learning Teams for Reflective Adaptation; NDP, National Demonstration Project; P&CD, Prevention and Capacity Demand; CoMPaIR, Contexts and Models in Primary health care and the impact on Interprofessional Relationships; BCD, Behind Closed Doors; Prac-Cap, practice capacity for chronic disease.

Impacts

Communication

Improved communication among members of the primary care practice was a universally intended objective of interprofessional team policies or interventions. However, there was considerable variation in the form and quality of communication resulting from specific interventions and policies. Some practices did not hold regular team meetings involving different practitioners and those who did sometimes encountered difficulties due to power dynamics within practices (USA, Alberta, Ontario, and Quebec). In Ontario, one family health team (FHT) never held meetings between administrative and clinical staff working in the organization, and all decisions were made by a group of FHT owners. By contrast, in other FHTs, staff met regularly, actively organized mentoring, and actively reflected on processes of collaboration.

The successful implementation of intrapractice teamwork implies bridging of the traditional communication gap between reception (front office) and clinicians (back office) to office workflow and patient flow.[21] There was little consistency in the content, conduct, or timing of communication between front and back office. Much communication was informal – associated with the transfer (charting, details of next appointment, etc) or seeking of information (the best specialist to refer to, getting sign-offs on prescription renewals, new scripts, etc).

Relationships

In all jurisdictions, there were some improvements in interorganizational relationships and partnerships. The traditional loose federation of autonomous physicians was simply not consistent with the sharing and ongoing learning required for continually improving patient-centered care (USA).

Table 3 Impacts of interprofessional team interventions and policies on communication, relationships, roles and satisfaction of PHC providers by jurisdictions

	Alberta	Ontario	Quebec	USA	Australia
Communication	Variable: in some PCNs, communication improved. In others, lack of role clarity resulted in difficult and/or miscommunication	Improved informal communication within and between practices. But variability in form: some never held meetings; others met regularly, actively, organized mentoring and actively reflected on processes of collaboration	Improved communication between providers within practices	Variable improvement. In some practices, communication was fostered especially between front and back office. In others, minimal impact due to conflict and power relationships	Improved communication between GP and nursing staff. However, some practices rarely had staff meetings or separate clinical and administrative meetings. Poor communication with external AHP and psychologists
Professional roles	Variable acceptance of roles related to knowledge and trust in each other's competence. In some practices, doctors took on new roles (eg, more complex conditions)	Broadening of nurse responsibilities as well as the new role of NP. However, many (AHP and NP) felt they were not working to their scope of practice. Challenged work practices and professionals ideas of their roles. Family practitioners working in the same way they had been prior to the new model	Some tension regarding new roles. A clear division of labor was required but not achieved. Shared professional responsibility was regarded as being limited by the power of the medical profession and professional associations	Staff took on new roles and responsibilities as long as it did not encroach on the physician's autonomy and role. Positive where there was openness about working and learning involving both medical and nonmedical staff together	Development of new roles for nurses and allied health despite uncertainty by doctors about their competencies and capacity
Relationships	Improved respect. However, assumption that network relationships occur naturally not requiring formal partnership. Behavior within meetings was a strong determinant of participation, collaborative decision making, respectful interactions	Further developed partnerships between PHC and community programs. Confusion about roles created some tension in some practices. Some friction with doctors over role of NP. Some resistance to change especially within established practices	Formal interorganizational relationships improved over time. Personal trust was limited by poor understanding of other roles. Shared professional responsibility opposed by the medical profession and professional associations	Improved relationships and shared decision making within practice in less hierarchical open decision making. Some conflict when power and authority of doctors or practice manager was challenged. Territoriality in team interventions was seen as the FP's turf	Improved between practice and allied health services. But constrained by lack of knowledge of services. Some conflict over role of doctors and nurses. Doctors retained control over referral
Work satisfaction	Improved satisfaction and retention of nonphysician staff in less hierarchical teams	Generally improved. However, some frustration that expectations were not met. Many nursing and allied health confronted a clash between their expectations of interprofessional care and their experiences. Physicians felt their workload had not decreased	Improved work satisfaction of providers in FMGs	Those able to implement intervention really loved it and felt energized. Others were frustrated with the lack of progress	Improved satisfaction with shared workload and improved patient outcomes. Some GP and AHP dissatisfaction with referral processes, limited exchange of information, bad working relationships

Abbreviations: PHC, primary health care; PCN, primary care network; GP, general practitioner; AHP, allied health professional; NP, nurse practitioner; FP, family physician; FMG, Family Medicine Group.

However, the links between primary care organizations and other community-based organizations remained weak (Ontario) except in Quebec where PHC reform was embedded in a broader reform of locally organized hospital- and community-based care networks.[22]

At an interprofessional level within practices, there were generally improved relationships. However, this was constrained in some practices by hierarchical decision making about roles and responsibilities and other providers' lack of knowledge (USA, Australia, and Ontario). Physically isolated providers found it hard to integrate with their colleagues and were less able to give others an idea of their skills and potential contributions (Ontario).

> At the beginning [the] GP did not entirely trust allied health professionals [dieticians] to treat the patient as he wanted them treated, so he was doing all the work himself. Now he is [referring to] dieticians and can see the value of their participation … [Nurse facilitator, Australia][23]

Role change

There was adaptation to extended roles for nonphysician staff within practices across jurisdictions. In some practices, clear roles emerged and strong support for different professionals was evident.

> Teamwork makes general practice sustainable. It means not everything is on the GP's shoulders. It also means everyone in the team is valued for what they do and this engenders happiness amongst the staff. [Physician, Australia][24]

However, a clear division of roles was not always achieved with some confusion about roles, which created tension in some practices (Ontario, Alberta, and Quebec). Conflict emerged as some providers felt their power was challenged (USA). This led to dissatisfaction with communication, and the processes for sharing care and changes were met with resistance, disengagement, or conflict (Australia, USA, Ontario, and Quebec).

One pharmacist said that physicians did not always understand the

> value that the pharmacist can provide to their patients. They're … very receptive to the idea of working with … a pharmacist … but it's kind of, 'Alright, you know we're really glad to have you here. This is great, but what do we do with you?' [Ontario][39]

Sometimes the lead physicians, managers, or CEOs did not necessarily know the skills, knowledge, or experience possessed by other members of their team (Australia and Ontario). Other barriers to a more comprehensive scope of practice included doctors' discomfort with what allied health professionals could do, lack of trust and lack of time to write medical directives, and change and uncertainty about their scope of practice (Australia and Ontario). Nurses seeking an expanded role were particularly frustrated with these hurdles:

> There's frustration that what we have been asked to do is … more an administrative role, in terms of filling out lab requisitions for the doctors, calling patients back with abnormal test results, and things like that. And that is not … purposeful use of our time, that … in terms of working to maximum scope, there's lots more that we can do. [RN, Ontario][39]

Change created uncertainty about what their responsibilities were and how best to respond to a new set of circumstances (Australia, Alberta, and Ontario). This situation was applied not only to clinical staff but also to administrative staff who were sometimes uncertain about what procedures they should follow especially in engaging other staff in management. For example, in some practices, there needed to be a change in practitioner routines, so that the new activities could fit into existing responsibilities and their sequencing (eg, a nurse arranging to see a patient for care planning both before and after the patient's GP appointment) (Australia). Some identified roles that they had not previously perceived that they had. For example, reception and nursing staff played roles in triage, support, advocacy, and listening. These "shadow" team roles often went unacknowledged (Australia).

In all jurisdictions, redefinition of roles challenged the way health care providers (especially doctors) thought about their professional identity and autonomy. Adopting team care challenged some physicians who had deeply held beliefs that the role of the family physician was grounded in a strong, trusting relationship between the patient and physician. Permitting other practice staff to have meaningful patient interactions for team care meant expanding that special relationship and required an identity shift. Physicians who had deeply held beliefs about the centrality of the doctor–patient relationship found permitting other practice staff into that relationship particularly difficult as it required a shift in their identity (USA).

Readiness for change

There was evidence that although many clinicians were ready to change (prompted at least in part by a degree of work dissatisfaction), this needed to be adapted to the individual practice

context and culture (Australia, USA, Alberta, and Ontario). In some practices, the changes were viewed as increasing the burden on the organization (eg, with increased paper work) and stretching capacity (eg, by increasing the workload of some health professionals) or, conversely, not drawing sufficiently upon staff to work to the full scope of their practice (Australia, USA, Alberta, Ontario, and Quebec). Practice leadership was often seen as important in facilitating readiness to change (Ontario and USA). Our findings on leadership are described later.

Work satisfaction

In all jurisdictions, there were improvements to work satisfaction where teamwork was purposefully implemented.

> Doing stuff in the context of a team is so much better than trying to do it all myself. It's just such a relief. All I can say is, everything is more doable and more enjoyable with a team. [Physician, USA][25]

These improvements made attracting new staff easier and could be part of a virtuous cycle where the climate of teamwork was in turn attractive to staff who were committed to working in an interprofessional environment (Quebec). There was a complex association between changed teamwork and work satisfaction. Those staff members who were somewhat more dissatisfied with their current work situation were more ready to change their team roles, and they were more likely to actively participate in the change (Australia and Ontario).

Once teamwork innovations were introduced, this raised expectations that nonphysician roles would be extended. If these were met, work satisfaction improved. There was increased work satisfaction of nonphysician staff in less hierarchical or less physician-centric teams (Alberta), and this was associated with greater retention of nonphysician staff. However, if these expectations were not met and they were unable to extend their scope of practice, this could lead to staff member frustration and dissatisfaction. Where staff felt disempowered or not encouraged to participate in decision making, there was a higher incidence of staff feeling undervalued, underutilized, and dissatisfied (Ontario).

Influence of local factors

Variations in these impacts on practitioner communication, relationships, roles, readiness to change, and work satisfaction were mediated by a range of local contextual issues, including the type and size of practice, location and organization of teams, and leadership.

Types of practices

The influence of type of practice was complex. In Ontario, Alberta, and Quebec, different types of practices seemed to respond to teamwork in different ways. For example, Community Health Centers in Ontario, Family Medicine Groups in Quebec, and Primary Care Networks in Alberta, tended to involve other professionals in a broader scope of practice than traditional general practices, including in chronic disease management. In Australia, while larger practices were able to incorporate a broader range of health professionals in care, smaller practices found the introduction of new roles easier than larger practices:

> It is really important to have open lines of communication with everybody, especially when there is more than one GP. The more people you have in your practice the more systems you need. [Practice manager, Australia]

Many interventions involved the addition of new types of employees (administrative, nursing, allied health, and social work) (Australia, Alberta, Ontario, and Quebec), which changed and complicated clinical governance and the way health professionals worked and interacted with practices, at least initially.

Colocation

Colocation facilitated getting to know one another, building trust, and establishing new practice patterns. Trust, in turn, made developing shared goals possible.

> The GP gets to know allied health professionals personally. He only uses allied health professionals that he knows well. [RN, Australia][23]

However, colocation itself did not always ensure effective interprofessional working relationships. In Alberta, effective communication strategies, whether face to face or virtual, were recognized as being essential if trust, respect, and common understanding were to be achieved. Without these, colocation alone did not achieve desired outcomes. For example, in other contexts, while psychologists and allied health were colocated with some practices, they were often in reality only "renting a room" and were not a "part" of the team (Australia).

Space

The organization of physical space within practices influenced the extent to which communication and shared care

processes could be effectively established (Alberta and Ontario). Some practices took initial steps by creating stable physician–medical assistant teams and locating physicians and medical assistants in the same work area (USA). However, in some instances, space was used to reinforce the hierarchy already present. One example of how this happened emerged where allied health professionals were required to ask permission to use rooms that "belonged" to physicians (Ontario). In this example, allied health professionals spent much of their time seeking space to use for consultations. Space concerns were also found relating to privacy issues that were apparent in the way that physical space was organized – for example, no private space was allotted for "distressed" patients waiting for an appointment, which burdened reception staff with the need to identify this issue and attempt to "make do" within their physical space limitations (Australia).

Leadership

Leadership style set the tone for the culture of teamwork. Physician support was important in achieving and maintaining changes to team roles. Consistent and clear leadership increased resilience among individuals and the team and mediated the negativity of the challenges they experienced as they worked to develop new working relationships. In Ontario, a balance between clinical and nonclinical leadership seemed necessary to allow practices to maximize the benefits of interprofessional teamwork. A vacuum in clinical leadership left staff feeling undervalued, underutilized, and dissatisfied with the current situation.

Some teams were built on physician leads, while others developed leadership roles for other professionals. However, in most cases, the viability of programs or policies depended on physician support, at the very least. Hierarchical teams were more likely to report frustration of expectations and dissatisfaction (USA).

Discussion

Our study found considerable similarities between jurisdictions in the impacts of PHC teamwork innovations on quality and form of communication, changes to scope of practice, conflict, and work satisfaction. As others have, we found that the impacts of teamwork varied, being modified by intrapractice contextual factors including practice model, colocation of services, leadership style, and space.[26,27] Our multijurisdictional comparison showed how the differences within the jurisdictions studied were often greater than those existing between jurisdictions. Although the extent of intrajurisdictional variation has been documented in some cross-national comparative surveys, our methods allowed us to understand the origin of this variability.[28]

Teamwork innovations can promote better communication, better relationships, and greater satisfaction of the workforce. However, they can also contribute to conflict if professionals have poor understanding of each other's roles.[12] Roles need to be clearly articulated and negotiated if team innovations are to have the desired effects.[29]

Some practitioners were challenged by changes in roles – relating to skills and capacities of staff and confusion over work practices (such as what to do with patients when they present to reception staff). However, role boundaries and power and autonomy were the key factors. In particular, teamwork challenged the autonomy and decision making of physicians, especially in the USA. Staff in hierarchical, physician-centric practices tended to respond most negatively. The influence of hierarchy and professional power on linkages between general practices and other providers have been previously described in Australian, Canadian, and UK general practice.[30–32]

Staff in services where practitioners were able to develop confidence in each other's roles and in which roles and tasks could be assigned on the basis of skill and capacity rather than power responded more positively. The development of interprofessional teamwork required clinical leadership that was both able to make decisions (physician support was important here) and empowered all staff members to collaborate and develop flexible roles. This was especially important in the management of chronic illness in PHC.[33]

In some cases, the interventions or reforms examined here had a focus on teamwork, but not all studies did. Collaborative synthesis allowed investigators to reanalyze data from completed studies that had already been published and look at that data through a new lens, in this case teamwork. Original findings from these studies were not revised; instead, new insights were developed through reanalysis of the data against similar studies from other jurisdictions. While any one study may have concluded an impact of teamwork, the strength of this study is through the comparison across contexts.

There are a number of limitations to this study. The studies in this synthesis were conducted throughout the first decade of this century covering most of the significant innovations in teamwork in primary care across three countries during this period. However, there were other changes and they built on changes in the previous decade. Furthermore, our synthesis integrated findings from studies that were conducted at various stages of these reforms. The reforms and interventions evaluated in these studies were variable, ranging from discrete interventions to naturalistic evaluations of the introduction of

new policies within a jurisdiction. In addition, these impacts were observed in only a sample of practices in each jurisdiction. It should be noted that the methodology described here is innovative and not yet tested more broadly. However, it builds on established methods and adds to them the important element of reflexivity, an essential and established element of all qualitative research and often lacking from other approaches that combine findings from published research. Experienced researchers who are thoroughly knowledgeable about their own work might benefit from this interactive process for systematic reflection and synthesis. The strength of this study is that we now better understand the impact of teamwork reforms across jurisdictions. These should incorporate the patient viewpoint, which most of these studies only addressed in a minor way.

Conclusion

Key findings were that although the impacts of the reforms and interventions designed to enhance interprofessional teamwork were generally positive, they did vary under the influence of professional and organizational contexts, especially, the model of practice. However, differences in impact were greater within than between jurisdictions. Leadership hierarchies and lack of knowledge of other team members' roles challenged the adoption of new configurations of team-based practice. To avoid negative impacts and achieve their desired goals, policy makers need to be aware of the complexity of the PHC context into which reforms are introduced and the consequent variation in impacts and responses. This leads to some important implications. First, leadership at the practice level matters with collaborative decision making about roles needing to be facilitated rather than being expected to emerge. Second, some flexibility for local adaptation is needed with mechanisms established to monitor the impacts across different contexts and models of practice.

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Author contributions

Mark F Harris and Jenny Advocat contributed to the conception, analysis, and interpretation of the data and drafting and revision of the manuscript. Benjamin F Crabtree, Jean-Frederic Levesque, William L Miller, Jane M Gunn, William Hogg (co-chief investigator), Cathie M Scott, Sabrina M Chase, and Lisa Halma contributed to the conception, analysis, and interpretation of the data and critical revision of the manuscript.

Grant M Russell was co-chief investigator, coordinated the project, and contributed to the conception, analysis, and interpretation of the data and critical revision of the manuscript. All authors have given final approval of the version to be published and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Disclosure

The authors declare no conflicts of interest.

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Supplementary material

Table S1 Example of summary matrix used to compare impacts across studies and jurisdictions

Themes	Jurisdiction: Ontario
	Study: # 2 (Behind closed doors)
Care processes and referral	Reutilization of community resources: Reasonable partnerships in CHCs. Cooperation with other CHCs and some FPs in particular, but more because of the model of care not team orientation. The FHTs are weak in this regard; most that do use community resources limit referrals to other health care resources. Two FHTs made some early attempts to build partnerships and integrate community resources more, but in light of a general lack of orientation to this model, one discontinued the practice because it was inconvenient (despite positive patient feedback). In contrast, the CHC excelled in this area. Re-referrals: referrals are internal in the FHTs and do not assume a partnership orientation.
Communication	+ Informal communication seemed regular (modified by space and culture) and ± Great deal of variability between practices, some never held meetings, others, like the most "mature" FHT, which met regularly, actively organized mentoring, and actively reflected on processes of collaboration. Social workers were relatively isolated.
Trust/relationship	± Evolution of trust over time with regard to the work of NPs and less trust in those FHTs where certain professionals had specialty training to work with specific subpopulations (eg, an NP who is specialized in care of patients with complicated diabetes).
Task/role realignment	Significant in most FHTs with new professionals. However, mostly old routines persisted in the early years of the model. The competing demands (see later) affected this. Yet, some innovative routines evolved in the best led FHTs.
Power, decision making	– Governance varied significantly. Most decisions in the physician owned FHTs were made by physicians, more complex structures in a well-embedded FHT. In one FHT, all decisions made by a group of FHT owners, this FHT never held meetings between administrative and clinical staff. + Powerful, consistent, and clear leadership increased resilience among individuals and the team, mediating the negativity of the challenges experienced as they worked to develop new working relationships. – Clinical leadership was sometimes surprisingly absent. Much dysfunction found in an academic FHT could be traced back to a vacuum in clinical leadership. The FHT was characterized by a sense of disempowerment and with little encouragement for members to participate in decision making and the proposal of new ideas or exploration of new roles or modes of collaboration. Therefore, higher incidences of staff feeling undervalued, underutilized, and dissatisfied with the current situation.
Adoption and acceptance	+ In terms of integration of specialist expertise in primary care, FPs viewed their colleagues and FHT's pharmacists as a trusted, regular source of quality evidence. Nurse practitioners, allied health providers, and nurses will utilize the above and each other for decision support, recognizing their expertise. – The distinct philosophy, scope of practice, and different ways that NPs engage with their work all interact to generate some common problems with integration of the NP. – Dieticians/pharmacists expressed desire to do more "… they kind of have almost preconceived notions about what dieticians can see. You know, like diabetes, and weight management, and high cholesterol. And then a lot of times they don't think outside of that … [Registered Dietician] and work in different ways in different FHTs.
Work satisfaction	– Many found their skills exceed their tasks, led to dissatisfaction. – Many FHT members confronted by a clash between their expectations of interprofessional care and their experiences. Also different expectations of what moving into a FHT model would mean for them, their role, and their way of practicing. – Especially, a problem for NPs. For FPs in general, the changes were positive in terms of work satisfaction.
Practice size	The impact of a FHT (the Ontario model of PHC team). Increased practice size considerably, however, in networked models the individual practices often stayed the same in size. More commonly, there was coalescence of practices into a larger body.
Colocation	± FHTs increased the likelihood of colocation. – Non colocated team members were rarely integrated.
Space	– Physical space is a pervasive problem in FHTs. Lack of space limited hiring in some and a constant preoccupation for FHT managers. Indeed, many of the real teams existed at a site rather than at FHT level. ± Where someone sits in the FHT has much to do with feelings of being part of the team. Physically isolated providers found it hard to integrate with their colleagues and were less able to give others an idea of their skills and potential contributions.

(Continued)

Table S1 (*Continued*)

Themes	Jurisdiction: Ontario
	Study: # 2 (Behind closed doors)
Workload and workforce	– Some physicians thought the FHT model would mean that they would not have to see as many patients. However, 2 years after the transformation, the majority of family practitioners were working in much the same way they had been prior to the integration of the new model.
Scope of responsibility	± Many (AHP and NP especially) felt they were not working to their scope of practice. However, compared to normal practices there was a definite broadening of nurse responsibilities and new role of NP.
Leadership (decision making)	± The team led to the demand for leadership. A balance between clinical and nonclinical leadership seemed necessary. While each role required different skills sets, the "organic" nature of FHTs meant that physicians (in smaller FHTs especially) frequently took on operational roles, while in other sites administrators found themselves managing practitioners with whose clinical roles they are not familiar. In a number of FHTs a collaborative leadership role between clinical and nonclinical did not exist. The CHC was led by a physician who suggested: For me, it's a good personal fit. I think for a manager, I think it really helps if you've got a clinical background. I hear that a lot. I hear from my other fellow CHCs, particularly when they have non-clinical managers. Sometimes the clinicians feel like their concerns are not understood, or are not given the import that they wish that they would be given.
Financial model (business)	– We found an inherent barrier to interprofessional care generated by existing physician-oriented incentive structures. It has become more and more of an issue. The team itself raised the problem, but the financial structure generated it.
Concurrent change (competing demands)	± Team care added the demands on (and requirements for efficient leadership and management). Other demands came from the model requirement to optimize access and increase the quality of chronic disease care. These in themselves generated a need for effective teamwork.

Note: + indicates a positive impact, – indicates a negative impact, ± indicates a variable impact.
Abbreviations: CHC, Community Health Center; FP, family physician; FHT, family health team; NP, nurse practitioner; AHP, allied health professional; PHC, primary health care.