OXFORD

Health Service Research

Contextual levers for team-based primary care: lessons from reform interventions in five jurisdictions in three countries

Grant M Russell[a],[*], William L Miller[b], Jane M Gunn[c], Jean-Frederic Levesque[d],[e], Mark F Harris[d], William E Hogg[f],[g], Cathie M Scott[h], Jenny R Advocat[i], Lisa Halma[j], Sabrina M Chase[k] and Benjamin F Crabtree[l]

[a]Southern Academic Primary Care Research Unit, School of Primary and Allied Health Care, Monash University, Clayton, Australia, [b]Department of Family Medicine, Lehigh Valley Health Network, Allentown, USA, [c]Department of General Practice and Primary Health Care, University of Melbourne, Melbourne, Australia, [d]Centre for Primary Health Care and Equity, University of New South Wales Australia, Sydney, Australia, [e]Bureau of Health Information, Chatswood, NSW, Australia, [f]C.T. Lamont Primary Health Care Research Centre, Bruyère Research Institute, Ottawa, Canada, [g]Department of Family Medicine, University of Ottawa, Ottawa, Canada, [h]Alberta Centre for Child, Family and Community Research, Edmonton, Canada, [i]Southern Academic Primary Care Research Unit, School of Primary Health Care, Monash University, Clayton, Australia, [j]Zone Analytics and Reporting Services, Alberta Health Services, Edmonton, Canada, [k]Rutgers Biomedical and Health Sciences (RBHS), Rutgers School of Nursing, Rutgers University, New Brunswick, USA and [l]Department of Family Medicine and Community Health, Rutgers Robert Wood Johnson Medical School, New Brunswick, USA.

*Correspondence to Grant M. Russell, School of Primary and Allied Health Care, Monash University, 270 Ferntree Gully Road, Notting Hill 3168, Australia; E-mail: grant.russell@monash.edu

Abstract

Background. Most Western nations have sought primary care (PC) reform due to the rising costs of health care and the need to manage long-term health conditions. A common reform—the introduction of inter-professional teams into traditional PC settings—has been difficult to implement despite financial investment and enthusiasm.

Objective. To synthesize findings across five jurisdictions in three countries to identify common contextual factors influencing the successful implementation of teamwork within PC practices.

Methods. An international consortium of researchers met via teleconference and regular face-to-face meetings using a Collaborative Reflexive Deliberative Approach to re-analyse and synthesize their published and unpublished data and their own work experience. Studies were evaluated through reflection and facilitated discussion to identify factors associated with successful teamwork implementation. Matrices were used to summarize interpretations from the studies.

Results. *Seven* common levers influence a jurisdiction's ability to implement PC teams. Team-based PC was promoted when funding extended beyond fee-for-service, where care delivery did not require direct physician involvement and where governance was inclusive of non-physician disciplines. Other external drivers included: the health professional organizations' attitude towards team-oriented PC, the degree of external accountability required of practices, and the extent of their links with the community and medical neighbourhood. Programs involving outreach facilitation, leadership training and financial support for team activities had some effect.

Conclusion. The combination of physician dominance and physician aligned fee-for-service payment structures provide a profound barrier to implement team-oriented PC. Policy makers should carefully consider the influence of these and our other identified drivers when implementing team-oriented PC.

Key words: Evaluation studies, health care reform, policy, primary health care, qualitative research.

Introduction

Most governments acknowledge that strong, high quality primary care (PC) delivery systems are associated with improved health outcomes [1,2], national and regional policies intended to optimize equity, accessibility and health care quality have emerged. New organizational models of care have been introduced [3], financial incentives have promoted adherence to guidelines [4], and local coordination bodies have linked PC together and with the broader health care system [5].

Most PC reforms are geared towards activities, within the PC practice, defined for this work as *the organization from where primary, continuing, comprehensive and whole-patient medical care is delivered to individuals, families and their* communities [6]. In most Western nations, PC practices have comprised either single-handed or small group businesses and been physician owned, often employing nurses and office staff to assist in the delivery of care to patients.

Many recent PC reform approaches have prioritized inter-professional team formation [7], as a key part of broader strategies to implement the patient-centred medical home. Enhanced team functioning has been associated with treatment quality, clinical outcomes and patient safety [8], as well as improvements in staff wellbeing [9] and reduced health service utilization [10].

However, team implementation in traditional PC practice settings has been challenged by differing practitioner values [11], overlapping scopes of practice [12], issues of professional accountability [13] and patient preferences for enduring relationships with individual physicians [14]. While there is some evidence that inter-professional education can improve teamwork and, in turn, a range of clinical outcomes [15], in the PC setting, such interventions have generated only modest impact on professional practice and health outcomes [16].

Empirical studies of teamwork in PC have, characteristically, used practice cohorts within a single jurisdiction. This limits generalizability and makes it more difficult to explore contextual factors that may influence team performance—both areas important to policy makers and clinicians interested in PC reform.

This article results from collaboration between nine investigators with a common research interest in understanding the effects of reforms on PC practices. We used a deliberative process to explore common features and critical differences in the findings of 12 broadly similar studies, all focussed on examining change in PC practices at a time when many nations were exploring the implementation of comprehensive PC reform. We aimed to identify common contextual factors influencing the successful implementation of teamwork within PC practices in different jurisdictions within the USA, Canada (Alberta, Quebec and Ontario) and Australia. We had a particular focus on the transition of PC practices and delivery systems from traditional models to models incorporating team-based care.

Methods

The study used a novel research design—Collaborative Reflexive Deliberative Approach (CRDA). Here, authors of original research papers act as participants who come together to reflect on and synthesize findings from their own published and unpublished research. The methodology draws upon the principles of participatory action research [17], narrative synthesis [18] and open system approaches to realist and meta-narrative evidence review [19]. We used Xyrichis' definition of teamwork in health care which views teamwork as *a dynamic process involving two or more health professionals with complementary backgrounds and skills, sharing common health goals and exercising concerted physical and mental effort in assessing, planning or evaluating* patient care [20].

Participants were investigators on 12 studies from five jurisdictions evaluating PC reform interventions. Table 1 shows the title, context, description and relevant publications for the 12 studies. Interventions represented either natural PC policy reform experiments or were implemented as part of empirical research. Participants comprised five academic family physicians, three sociologists, a medical anthropologist, a public health physician and an epidemiologist. Three had direct policy making responsibilities.

The CRDA involved four stages: (i) selecting, extracting and classifying original published studies from each participant's program of research; (ii) re-extracting and analysing broader study materials and unpublished information from each study; (iii) absorbing and reinterpreting knowledge from other relevant studies; and (iv) reflecting and integrating insights from individual and group reflections. This iterative process of reviewing and synthesizing was accomplished using a combination of monthly teleconferences and four face-to-face retreats. During the retreats (led by a facilitator familiar with the PC setting), we explored and challenged findings from our work, all the while seeking reflective insights concerning those contextual influences on teamwork in PC practice settings [21].

These data were organized into matrices to document characteristics of PC in each jurisdiction. A *context matrix* detailed each jurisdiction's perceived historic drivers of reform and timing and trajectory of reform since 2000. A s*tructural and process matrix* documented PC governance, quality improvement processes, remuneration, funding, information systems and health and human resources [22]. A *teamwork matrix* collated the characteristics and intensity of teamwork in each setting and existing organizational culture and decision-making processes. The matrices underwent ongoing modification through the study. Context and findings matrices are shown (Supplementary Tables S1 and S2, respectively). Finally, using an iterative process involving reading, reflection and facilitated discussion, we identified and elaborated common contextual aspects of PC practices that influenced the implementation of teamwork.

Results

We found substantial variation in how PC teams formed, how they interacted, and the quality of their interaction. Although variation was as pronounced between practices in the same setting as it was between jurisdictions, it was clear that the characteristics of the PC system *beyond the practice* influenced the degree and nature of teamwork

Table 1. Description, summarized findings and key publications from 12 core studies

Study title	Setting	Study description	Primary care practices	Findings	Key publications
Re-order— Re-organizing the care of depression and related disorders in a primary care setting	Victoria and Tasmania, Australia	Longitudinal observational and participatory action research project. The aim was to gather information to assist in the design of a new model for thinking about, and improving, primary care depression diagnosis and management.	6	The study gathered views concerning the key elements of exemplary depression care—576 patients and 300 stakeholders from clinical, academic, public and policy settings. Investigators then worked with general practices to document depression care in the Australian setting to identify areas for improvement, test out interventions for improving and develop principles for an exemplary model of depression care for Australia	Gunn JM, Palmer VJ, Dowrick CF Herrman HE, Griffiths FE, Kokanovic R, et al. Embedding effective depression care: using theory for primary care organisational and systems change. *Implement Sci.* 2010; 5:62.; Palmer V, Gunn J, Kokanovic R, Griffiths F, Shrimpton B, Hurworth R, et al. Diverse voices, simple desires: a conceptual design for primary care to respond to depression and related disorders. *Fam Pract*. 2010;27(4):447–458.
Teamwork	Three states— Australia	The Teamwork study was a large cluster randomized controlled trial. The intervention involved facilitation of teamwork in chronic disease management involving staff collocated within existing practices	60	The intervention was relatively effective in developing collaborative activities especially care planning and shared information systems, and some improvements in practice routines. These were more effective in small practices. There was improved trust but the roles of nurses were still underdeveloped.	Harris MF, Jayasinghe UW, Taggart JR, Christl B, Proudfott JG, Crookes PA, et al. Multidisciplinary Team care arrangements in the management of patients with chronic disease in Australian general practice. *Med J Aust.* 2011; 194(5): 236–239.; Christl B, Harris MF, Jayasinghe UW, Proudfoot J, Taggart J, Tan J. Readiness for organisational change among general practice staff. *Qual Saf Health Care.* 2010; 19:5:e12.
Teamlink multidisciplinary teamwork between general practice and allied health services	New South Wales, Australia	Quasi-experimental study that aimed to increase teamwork between general practice and allied health providers located outside the practice	34	The structural links were provided by the requirement that referral to allied health required a GP care plan to specify which providers were involved in the 'team care arrangement'. In response to facilitation, there was evidence of improved referrals but there was little progress in developing trust, effective direct communication and power sharing.	Chan B, Proudfoot J, Zwar N, Davies GP, Harris MF. Satisfaction with referral relationships between general practice and allied health professionals in Australian primary health care. *Aust J Prim Health*. 2011; 17(3): 250–258.; Harris MF, Chan BC, Daniel C, Wan Q, Zwar N, Davies GP. Development and early experience from an intervention to facilitate teamwork between general practices and allied health providers: the Team-link study. *BMC Health Serv Res*. 2010; 10: 104.
Prac-Cap	Five Australian states and one territory	Aimed to examine the association between practice capacity (including multidisciplinary team roles and climate, clinical linkages between the practice and other services, business and information management), with the quality of care for patients with: type 2 diabetes, cardiovascular disease or asthma	97	The quality of chronic disease care varied significantly between practices but not between primary care organizations. Quality of care was found to be related to both the size of the practice and to practice capacity factors. Compared with larger practices (other factors being equal), those with one to four GPs showed higher scores for quality of clinical care. The quality of chronic disease care was related to the level of teamwork among staff, the use of computers to enable effective medical record management and patient follow-up, and the clinical linkages between the practice and other services. Team climate is linked to GP staff work satisfaction.	Oldroyd J, Proudfoot J, Infante FA, Powell Davies G, Harris MF, Bubner T et al. Providing healthcare for people with chronic illness: the views of Australian GPs. *Med J Aust*. 2003; 179(1): 30–33.; Beilby J, Holton C, Harris M, Proudfoot J, Infante F, Bubner T, et al. Organizational capacity and chronic disease care: an Australian general practice perspective. *Aust Fam Physician*. 2007; 36(4): 286–288.

Table 1 *Continued*

Study title	Setting	Study description	Primary care practices	Findings	Key publications
CoMPaIR—Strengthening primary health care services through innovative practice networks	Alberta, Canada	CoMPaIR was a longitudinal, participatory, deliberative program of research using a cross-case comparative design to develop in-depth understanding of the inter-relationship between context and models of primary care and their impact on inter-professional relationships. One specific intent was to support capacity development for sharing and using evidence among study participants.		The program was implemented in two phases—local and provincial. The research team worked with local leaders to identify a particular program or project on which to focus. Three Primary Care Networks (PCNs) located within the former Calgary Health Region participated in Phase 1; two additional PCNs participated in Phase 2. All five participating PCNs were mandated to achieve five common objectives. Despite this provincial commonality, local context had a marked influence on the models that were adopted and the ways in which teams functioned. A final component of the study involved comparison of the results from Phases 1 and 2 with similar studies in other provincial contexts.	Scott C, Hofmeyer A. Networks and social capital: a relational approach to primary healthcare reform. *Health Res Policy Syst.* 2007; 5: 9.
COMP-PC—Comparison of models of primary health care in Ontario	Ontario, Canada	The comparison of models was a cross-sectional observational study of four family practice models in Ontario during a transformative change period. Cross-sectional mixed-method design with nested qualitative case studies	137	Instruments used surveys based on the Primary Care Assessment Tool and qualitative interviews. The study found that no one model that was superior in all aspects of quality. There were large variations in the quality of care between practices of the same model, and several factors were found to be more strongly associated with the quality of care delivered than the model itself. These factors included practice organization and team structure	Russell G, Dahrouge S, Tuna M, Hogg W, Geneau R, Gebremichael G. Getting it all done. Organizational factors linked with comprehensive primary care. *Fam Pract.* 2010; 27(5): 535–41.; Russell GM, Dahrouge S, Hogg W, Geneau R, Muldoon L, Tuna M. Managing chronic disease in Ontario primary care: the impact of organizational factors. *Ann Fam Med.* 2009; 7(4): 309–18.; Dahrouge S, Hogg W, Russell G, Geneau R, Kristjansson B, Muldoon L, et al. The Comparison of Models of Primary Care in Ontario (COMP-PC) study: methodology of a multifaceted cross-sectional practice-based study. *Open Med.* 2009; 3(3): 149–64.
Behind the Closed Door (BCD). Using Ethnography to understand family health teams	Ontario, Canada	This ethnographic case study investigated the effect of the implementation of an advanced primary health care delivery model, the Family Health Team (FHT), on organizational and clinical routines, particularly those relating to the care of persons living with chronic illness	7	This study found wide variability in the implementation of chronic disease management. Several of the FHTs were grounded in traditional routines, making little use of new approaches to care delivery. In those practices experiencing routine change, collaborative leadership and a history of reform within the practice. Existing physician oriented incentive structures provided subtle barriers to inter-professional care	Russell G, Advocat J, Geneau R, Farrell B, Thille P, Ward N, et al. Examining organizational change in primary care practices: experiences from using ethnographic methods. *Fam Pract.* 2012; 29(4): 455–61.; Thille P, Ward N, Russell G. Self-management support in primary care: enactments, disruptions, and conversational consequences. *Soc Sci Med.* 2014; 108: 97–105.; Farrell B, Ward N, Dore N, Russell G, Geneau R, Evans S. Working in interprofessional primary health care teams: what do pharmacists do? *Res Social Adm Pharm* 2013; 9(3): 288–301.

Table 1 *Continued*

Study title	Setting	Study description	Primary care practices	Findings	Key publications
Accessibility and Continuity of Care: A Study of PHC reform in Québec	Quebec, Canada	Cross-sectional observational study that examined the evolution of PHC organizational models through the reform process (from 2005 until 2010) and to assess factors at the organizational and contextual levels that are associated with the transformation of PHC organizations and their performance	450	The various models related to differential level of teamwork being promoted by the primary care reform efforts. The models implemented involved mostly teams of doctors and nurses working together, linked by a formal contractual agreement within the practice and with local health authorities, and supported by governmental grants to fund administrative and rostering tasks.	Pineault R, Levesque JF, Roberge D, Hamel M, Lamarche P, Haggerty J. Accessibility and continuity of care: a study of primary healthcare in Québec. Québec: Gouvernement du Québec; Centre de Recherche de l'Hôpital Charles LeMoyne: 2009. Available at: https://www.inspq.qc.ca/pdf/publications/911_ServicesPremLigneANGLAIS.pdf. Accessed August 17, 2016; Levesque JF, Pineault R, Provost S, Tousignant P, Couture A, Da Silva RB, et al. Assessing the evolution of primary healthcare organizations and their performance (2005–2010) in two regions of Quebec province: Montreal and Monteregie. *BMC Fam Pract*. 2010; 11: 95.
MaChro-1—Primary health care models for patients with chronic disease	Quebec, Canada	This study looked at various organizational models of primary care and their influence on health, utilization and self-care for a cohort of chronically ill patients. The various models related to different levels of teamwork as part of the primary care reform.	33	Categorized PHC model by administrative type and by a taxonomy according to organizational attributes. HRQoL was measured by disease-specific questionnaires. PHC models differed with respect to case mix: community models served older patients with higher co-morbidity and lower health status. Multilevel logistic regression revealed that none of the PHC organizational models was associated with HRQoL. Despite their having patients with more complex health problems, HRQoL in patients of community practices was equivalent to that of patients in other types of PHC organizations.	Levesque JF, Feldman DE, Lemieux V, Tourigny A, Lavoie JP, Tousignant P. Variations in patients' assessment of chronic illness care across organizational models of primary health care: a multilevel cohort analysis. *Healthc Policy*. 2012; 8(2): e108–123.; Breton M, Levesque JF, Pineault R, Lamothe L, Denis JL. Integrating public health into local healthcare governance in quebec: Challenges in combining population and organization perspectives. *Healthc Policy*. 2009;4(3):e159–78. Feldman DE, Levesque JF, Lemieux V, Tourigny A, Lavoie JP, Tousignant P. Primary healthcare organization and quality-of-life outcomes for persons with chronic disease. *Healthc Policy*. 2012; 7(3): 59–72.
Prevention and Competing Demands in Primary Care	Nebraska, USA	Ethnographic comparative case study design to observe clinical preventive service delivery and to understand variation in quality of care in 18 purposefully selected Midwestern family medicine offices	18	Practices developed individualized approaches for delivering clinical preventive services, with no one approach being successful across practices. There was little evidence of teamwork in the delivery of preventive services. This led to the design of the Using Learning Teams for Reflective Adaptation or ULTRA intervention study.	Crabtree BF, Miller WL, Tallia AF, Cohen DJ, DiCicco-Bloom B, McIlvain HE, et al. Delivery of clinical preventive services in family medicine offices. *Ann Fam Med*. 2005; 3(5):430–35. Crabtree BF, Miller WL, Stange KC. Understanding practice from the ground up. *J Fam Pract*. 2001; 50(10): 881–7. Miller WL, McDaniel RR Jr, Crabtree BF, Stange KC. Practice jazz: understanding variation in family practices using complexity science. *J Fam Pract*. 2001; 50(10): 872–8.

Table 1 *Continued*

Study title	Setting	Study description	Primary care practices	Findings	Key publications
ULTRA—Using Learning Teams for Reflective Adaptation	New Jersey and Pennsylvania, USA	Practice intervention using mixed methods to evaluate the impact of facilitated team-building and reflection on quality of care. The ULTRA intervention study specifically targeted the development of communication and teams using a reflective adaptive process or RAP to enhance quality of care.	56	The intervention study failed to show significant clinical improvements. Despite not having regular practice meetings at baseline, 18 of 25 practices successfully convened improvement teams. There was evidence of improved practice-wide communication in 12 of these practices if strong leaders were involved. Eight practices continued RAP meetings for 2 years and found the process valuable in problem solving and decision-making.	Balasubramanian BA, Chase SM, Nutting PA, Cohen DJ, Obman Strickland PA, Croson JC, et al. Using Learning Teams for Reflective Adaptation (ULTRA): insights from a team-based change management strategy in primary care. *Ann Fam Med*. 2010; 8(5): 425–432.; Howard J, Shaw E, Clark E, Crabtree BF. Up close and (inter)personal: insights from a primary care practice's efforts to improve office relationships over time, 2003–2009. *Qual Manag Health Care*. 2011; 20(1): 49–61; Ohman-Strickland PA, Orzano AJ, Hudson SV, Solberg LI, DiCicco-Bloom B, O'Malley D, et al. Quality of diabetes care in family medicine practices: influences of nurse-practitioners and physician's assistants. *Ann Fam Med*. 2008; 6(1): 14–22.
NDP—National Demonstration Project (NDP)	USA (25 states)	Multi-method evaluation of the first major implementation of the patient-centred medical home in the USA. The NDP was launched in June 2006 as the first national test in the USA of a model of a particular PCMH model in a diverse sample of 36 family practices.	36	NDP practices made substantial progress towards implementing the technical components; however, there was little evidence that practices actually changed their work relationships. It was apparent that for most practices the process will take a high degree of motivation, communication and leadership; considerable time and resources; and probably some outside facilitation.	Nutting PA, Crabtree BF, Miller WL, Stewart EE, Stange KC, Jaen CR. Journey to the patient-centered medical home: a qualitative analysis of the experiences of practices in the National Demonstration Project. *Ann Fam Med*. 2010; 8(suppl 1):S45–56, S92.; Crabtree BF, Nutting PA, Miller WL, Stange KC, Stewart EE, Jaen CR. Summary of the National Demonstration Project and recommendations for the patient-centered medical home. *Ann Fam Med*. 2010;8(suppl 1):S80–90, S92.; Miller WL, Crabtree BF, Nutting PA, Stange KC, Jaen CR. Primary care practice development: a relationship-centered approach. *Ann Fam Med*. 2010;8(suppl 1):S68–79, S92.

within practices. Although meaningful inter-professional teamwork was occasionally seen in, for example a community health centre, or in a capitated practice with sophisticated leadership and a long history of innovation, in general, teamwork was fragmentary and nascent in the PC settings explored in our studies. Results are cross-referenced to the investigator's studies using abbreviations from Table 1.

Our data revealed seven levers acting on the transition of PC practices and delivery systems from traditional models to team-based care. Three levers (clinical payment model, distribution of work roles and governance of practice) were critical to the motivation and capacity of PC to move to a team-oriented model of care.

Lever 1—clinical payment models

Most jurisdictions continued to pay physicians fee-for-service, providing few meaningful incentives for family physicians to work collaboratively with other family physicians or clinicians from other disciplines. We found practices exclusively reimbursed by fee-for-service payments made minimal progress towards team-oriented care. Inter-professional isolation seemed both reinforced and rewarded in such models.

However, in the non-US jurisdictions, a range of reforms provided modifications to existing fee-for-service payment systems. Australian practices received small incentives for after-hours service provision and for achieving immunization, cervical screening and diabetes management targets. By 2005, incentives were expanded to include payments for compilation of mental health and chronic illness care plans, and referral to allied health services. The Canadian sites made varying moves to a capitation model: Quebec's Family Medicine Groups (FMG) paid practices for enrolling patients and adjusted reimbursement for services provided to certain vulnerable populations. A number of Alberta's Primary Care Networks (PCN) introduced capitation based funding and provided salary support for leadership or administrative roles within the PCN. Ontario's Family Health Teams (FHT) began to receive the vast majority of their income from capitated payments.

These changes generated islands of team collaboration. Re-order's study of mental health care in Australia found that incentives for the preparation of mental health treatment plans saw practice nurses beginning to play a role in the identification of people with depression and who could benefit from a mental health plan. Some nurses

were opportunistically providing low level psychological support to some patients with depression but not as part of organized care.

Even with payment reform, practice routines were slow to change. Our Ontario data showed that many family physicians working within Ontario's capitated FHTs continued with short consultation times and minimal delegation for routine tasks (BCD).

Lever 2—clinical work distribution within practices: extent of direct physician involvement in service delivery

Despite widespread initiatives encouraging the growth of a non-physician PC workforce, we found little transition from a physician-oriented model of PC delivery. Some jurisdictions made reforms to introduce non-physician professionals into traditional PC settings: Alberta's PCNs and Ontario's FHTs incorporated NPs, pharmacists, dieticians, social workers and others into family practices, while Quebec and Australia expanded the practice nurse workforce. Although advanced practice clinicians such as NPs and physician assistants began to appear in the US practices, they often worked in parallel to the family physicians, either seeing acute presentations or developing their own panel of patients. As an analysis of the US National Demonstration Project found:

> Permitting other practice members into meaningful patient interactions for team care meant expanding that special relationship, and for many physicians, doing so required a substantial change in their identity as a physician. The shift required not only a change in roles of both physicians and staff, but also substantial changes in the way physicians thought about themselves. (NDP)

Although there was the potential for collaboration in most settings, clinicians tended to work in parallel, with only sporadic sharing of clinical records, ad hoc and opportunistic collaboration, and infrequent team approaches to individual clinical problems. The result was almost no shared work, minimal delegation and no redistribution of clinical responsibilities.

The most visible example of reallocation of clinical tasks across the sites came in the role of the practice nurse. Even within jurisdictions, practice nurse duties varied. Some merely provided technical assistance (triaging and preparing materials). Others assisted with clinical duties (immunization, pre-examination assessment), while at times roles were expanded, as in Quebec, to prescribe medications under collective prescribing orders (MaChro-1).

Reforms to chronic disease management and mental health delivery in Australia led to practice nurses providing patient education and in-depth assessments of the elderly and those with complex chronic illness. While this facilitated a degree of autonomy for the nurses and stimulated occasional inter-professional discussions of clinical management, the Australian initiatives continued to require physician sign-off for the delivery of care (Team-link).

Lever 3—practice governance: extent of physician ownership

Most practices in the studies were physician-owned and run as small businesses. Practice owners chaired meetings and made critical organizational decisions. In these sites, practice profits were only shared between physicians, non-physician staff being generally paid by salary. In Ontario's FHTs, pay-for-performance incentives were distributed to the physician owners, none flowing directly to the salaried nurses and allied health providers. FHT owner-physicians dominated meetings—non-medical staff being hesitant to speak, out of a concern of not being taken seriously or, sometimes, due to fear of belittlement. Physician resistance towards the adoption of the Quebec's FMG model was compounded by their inability to directly manage nurses contracted from government-run local community health centres (CHCs) to their practices (MaCHro).

By and large, reforms were not associated with changes in practice ownership. Nevertheless, a number of the jurisdictions contained PC practices operating under alternative governance models. Community health centres, US-based university residency practices and a community-owned FHT in Ontario each operated under the management of a Board of Directors. Community owned Community Health Centres had consistently high team climate scores (Team-Link and BCD), particularly when contrasted in the same jurisdiction with privately owned practices (BCD and Re-order).

The three US studies found meaningful team function to be rare except where an academic model was in place as with university owned or residency practices. Most demonstrated the 'dual hierarchy' of separate clinical and operational systems, where physician ownership compromised power sharing, particularly in the clinical domain.

Lever 4—external accountability and regulation

While CHCs were accountable to governing health authorities, the physician-owned practices in the jurisdictions had few regulatory requirements. Nevertheless, post-reform, various requirements for external accountability seemed to motivate a team-based approach to problem solving.

The Canadian models used team approaches to help meet targets for patient enrolment or to qualify for pay-for-performance incentives for quality clinical care (such as colorectal and cervical cancer screening and diabetes management). Although the NDP practices in the USA seemed motivated by being in the public eye, external accountability was only represented through Board certification and hospital medical staff membership [23]. The Re-order study found that the same Australian general practices that mobilized a team approach to meeting national accreditation standards had highly individualized approaches and minimal team communication concerning the management of depression (where no external clinical standards were required) (Re-order).

Lever 5—community and medical neighbourhood connections

Reform-related requirements to interact with the community and medical neighbourhood seemed to foster team-based care. Before reform, these small independent PC practices were relatively autonomous and had little direct contact with the community, other practices, or other parts of the health care system. Canadian and Australian reforms provided some opportunities to integrate PC practices with the rest of the system. Although reform models in Ontario seemed to address problems on their own, with minimal coordination with other community resources, Quebec and Alberta's emerging models of PHC have increased collaborative relationships with other sectors/and or health organizations, particularly to those with close geographic proximity. The impact of one of the apparent drivers of this local collaboration (regional health networks) was similar to that attributed by the Teamlink/Teamwork studies to General Practice Divisions (Australian PCOs charged with enhancing coordination between different parts of the PC system). The requirements for practice wide change in those Ontario and US practices involved in quality improvement collaboratives seemed to ease the path to team oriented care.

Lever 6—the role of professional organizations

Team care required shifts in the attitudes of providers and the organizations that represent them. At the individual level, this shift was found most difficult for physicians '*who had deeply held beliefs that PC doctoring was based in a strong, trusting relationship between a patient and a physician*' and bringing others into that relationship threatened what was special about PC doctoring. As such, this '*shift required not only a change in roles of both physicians and staff, but also substantial changes in the way physicians thought about themselves*' (23). This translated to the perspectives of professional organizations.

In each jurisdiction, reforming practices were of great interest by professional organizations. While the majority of these organizations endorsed inter-professional care, nursing and medical organizations had widely differing views about leadership and ownership. Across the jurisdictions, broad team-related reform required buy-in from medical professional organizations. The College of Family Physicians of Canada was a strong and passionate advocate of radical PC reform, as were the professional organizations that both conceptualized and championed the moves towards physician led Patient Centred Medical Homes.

Despite their support of reform, medical associations strongly promoted the centrality of the physician in delivering and organizing care. The Australian Medical Association acknowledged the potential of PC teams; however, they emphasized that '*general practitioners are the only clinicians appropriate to lead the primary care team, (and) … are the only primary care health professionals who can take responsibility for diagnosing, treating and managing care*' (6). By contrast, nursing bodies actively advocated a shift from a physician dominant model of care. Of significance, only in Ontario (home of 50% of nurse practitioners in Canada) was the government able to implement nurse practitioners as important parts of PC teams (3).

Lever 7—supportive external resources

During the processes of reform, external supports were provided sporadically, were often limited in scope and often lost in the complexity of the changes associated with the reform process. Nevertheless, several seemed to foster team-oriented family practice.

Outreach facilitators in the USA served as drivers for change by creating 'peer pressure', modelling good communication, encouraging reflection, supporting momentum and providing accountability (24). In other settings, facilitators were used as part of quality assurance or, in Australia, through some of the activities of the Divisions of General Practice program (Team-Link). Several jurisdictions fostered the personal and physical infrastructure within practices. Alberta and Ontario supported leadership training to up skill practice leads and Ontario (in their CHCs and FHTs) and Quebec provided practices with additional resources for clinic administration and meetings. The US studies showed the relationship between the practice governance and whether meetings are held at all. Thirteen of the 25 ULTRA practices never or only infrequently held meetings. Although Australia provided incentives for external health professionals to collaborate with practices in clinical care of patients with chronic disease, paperwork was overwhelming, and logistics meant that these inter-professional meetings were '*impossible to implement*' (Prac-Cap).

Several jurisdictions provided funding for PC practices to modify their physical space. Structural modifications allowed small, previously independent, practices to collocate in new buildings or form large virtual FHTs in Ontario, and, in Australia, create loose coalitions of allied health providers and GPs. Sharing of skills, planning and expectant care benefitted from face to face contact.

Discussion

Despite the variety in settings and the different political and organizational contexts of these newly reformed PC practices, we identified seven levers that influenced a jurisdiction's ability to implement team-oriented PC. The levers can be viewed as guiding principles for policy makers keen to encourage team-oriented models of PC delivery.

Team-based PC was promoted when funding for clinical care delivery extended beyond fee-for-service, where care did not require direct physician involvement and where practice governance included non-physician disciplines. The extent of inter-professional care within jurisdictions was also influenced by the position taken by health professional organizations towards team-oriented PC, the degree of external accountability required of practices, and the extent of their links with the surrounding community and medical neighbourhood. External programs involving outreach facilitation, leadership training and financial support for renovation and the promotion of team activities had some effect.

The levers interacted. A fee-for-physician service model fostered physician-aligned service provision, particularly where physicians owned practices and made decisions concerning resource allocation. Legislative requirements for physician signoff for clinical activities further consolidated power differentials between professions. The physician-oriented hierarchy within most of the practices limited modifications to clinical service roles and scope of practice for nurses and other providers. Across the jurisdictions, smooth implementation of reform initiatives required active cooperation of medical professional associations. Given that support from these associations was contingent on a model where PC remained '*the cornerstone of family practice*' (22), clinical decision making, practice governance and practice ownership remained under the control of family physicians.

Team function in PC has been a popular area of research. Our study is unique in its iterative and multi-jurisdictional investigation of the context of reforms to team-based PC. Studies within single jurisdictions have identified many of our levers in isolation. FFS payment structures (25), medical dominance and lack of distribution of pay for performance incentives (26) have been seen as impediments to team-oriented care. Others have identified the importance of community and medical neighbourhood connections (Lever 5) through quality improvement collaboratives (27) and care pathways (28). Similarly, external practice support (lever 7) has had an impact on team function through outreach facilitation (29), leadership training (16) and supportive physical space (30).

By contrast, unanticipated drivers emerged with stipulations for practices to either (i) meet an external requirement (such as practice accreditation in Australia); or (ii) to respond to contractual arrangements between practices and local networks for the provision of a broader range of population health services (as in Quebec).

Our novel methodology (21) has several limitations. Although three studies included aspects of teamwork as the main focus of the intervention, most had broader emphasis. Nevertheless, all had comprehensive data sets and in all settings, we were able to re-examine or extract teamwork-related data. While acknowledging the importance of intra-practice levers such as leadership, clear organizational goals and opportunities for meaningful team interaction (30), our study has focussed on those contextual factors potentially under the

control of policy makers. Other levers external to the practice may have influenced teamwork, a possibility increased by our focus on five jurisdictions and on our potential oversampling of early adopters. The passage of time, for example was clearly a factor in the evolution of teamwork in some jurisdictions. Notwithstanding, we doubt that major policy relevant levers have been overlooked, given our familiarity with the literature, the number of practices with accessible data (over 700) and the fact that the original studies included co-investigators or advisory committees covering all disciplines active in and governing PC teams.

Policy makers have been trying for nearly two decades to transform PC from a cottage industry to an integrated model, focused on prevention, responsive to the challenges of chronic disease, and able to deliver timely acute care. The associated incorporation of interprofessional teams has been predicated on principles of aligning the right practitioner to the right clinical task and optimizing the skills of the increasingly diverse health care workforce.

The combination of physician dominance and physician aligned fee-for-service payment structures provide a profound barrier to implementing team-oriented PC. Further work should be directed towards confirming our findings in different health care jurisdictions. Policy makers facilitating team-oriented PC may need to decide as to whether they have the energy to dismantle fee-for-service payment structures and reorient the long lasting cultural dominance of the medical profession.

Supplementary material

Supplementary data are available at *Family Practice* online.

Acknowledgements

Declaration

References

1. Kringos DS, Boerma W, van der Zee J *et al*. Europe's strong primary care systems are linked to better population health but also to higher health spending. *Health Aff (Millwood)* 2013; 32: 686–94.
2. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q* 2005; 83: 457–502.
3. Rosser WW, Colwill JM, Kasperski J *et al*. Progress of Ontario's Family Health Team model: a patient-centered medical home. *Ann Fam Med* 2011; 9: 165–71.
4. Casalino L, Gillies RR, Shortell SM *et al*. External incentives, information technology, and organized processes to improve health care quality for patients with chronic diseases. *JAMA* 2003; 289: 434–41.
5. Powell Davies G, Williams AM, Larsen K *et al*. Coordinating primary health care: an analysis of the outcomes of a systematic review. *Med J Aust* 2008; 188: S65–8.
6. Australian Medical Association. *Primary Health Care—2010: AMA Postion Statement*. 2010. https://ama.com.au/position-statement/primary-health-care-2010 (accessed on 15 September 2017).
7. Bodenheimer T, Ghorob A, Willard-Grace R *et al*. The 10 building blocks of high-performing primary care. *Ann Fam Med* 2014; 12: 166–71.
8. Körner M, Bütof S, Müller C, Zimmermann L, Becker S, Bengel J. Interprofessional teamwork and team interventions in chronic care: a systematic review. *J Interprof Care* 2016; 30: 15–28.
9. Willard-Grace R, Hessler D, Rogers E *et al*. Team structure and culture are associated with lower burnout in primary care. *J Am Board Fam Med* 2014; 27: 229–38.
10. Riverin BD, Li P, Naimi AI, Strumpf E. Team-based versus traditional primary care models and short-term outcomes after hospital discharge. *CMAJ* 2017; 189: E585–93.
11. Harris MF, Advocat J, Crabtree BF *et al*. Interprofessional teamwork innovations for primary health care practices and practitioners: evidence from a comparison of reform in three countries. *J Multidiscip Healthc*. 2016; 9: 35–46.
12. Thornhill J, Dault M, Clements D. CHSRF knowledge transfer: ready, set collaborate? The evidence says "go," so what's slowing adoption of interprofessional collaboration in primary healthcare? *Healthc Q* 2008; 11: 14–6.
13. Brown J, Lewis L, Ellis K *et al*. Conflict on interprofessional primary health care teams can it be resolved? *J Interprof Care* 2011; 25: 4–10.
14. Grumbach K, Bodenheimer T. Can health care teams improve primary care practice? *JAMA* 2004; 291: 1246–51.
15. Reeves S, Perrier L, Goldman J *et al*. Interprofessional education: effects on professional practice and healthcare outcomes (update). *Cochrane Database Syst Rev*. 2013; (3): CD002213.
16. Zwarenstein M, Goldman J, Reeves S. Interprofessional collaboration: effects of practice-based interventions on professional practice and healthcare outcomes. *Cochrane Database Syst Rev*. 2009; (3): CD000072.
17. Macaulay AC. Promoting participatory research by family physicians. *Ann Fam Med* 2007; 5: 557–60.
18. Barnett-Page E, Thomas J. Methods for the synthesis of qualitative research: a critical review. *BMC Med Res Methodol* 2009; 9: 59.
19. Scott RW. *Organizations: Rational, Natural, and Open Systems*. Upple Saddle River: Prentice Hall, 2003.
20. Xyrichis A, Ream E. Teamwork: a concept analysis. *J Adv Nurs* 2008; 61: 232–41.
21. Crabtree B, Miller W, Gunn J *et al*. Uncovering the wisdom hidden between the lines: the collaborative reflexive deliberative approach. *Fam Prac*. 2017. This issue.
22. Hogg W, Rowan M, Russell G *et al*. Framework for primary care organizations: the importance of a structural domain. *Int J Qual Health Care* 2008; 20: 308–13.
23. Nutting PA, Crabtree BF, Miller WL *et al*. Journey to the patient-centered medical home: a qualitative analysis of the experiences of practices in the National Demonstration Project. *Ann Fam Med* 2010; 8(suppl 1): S45–56, S92.
24. Nutting PA, Crabtree BF, Stewart EE *et al*. Effect of facilitation on practice outcomes in the National Demonstration Project model of the patient-centered medical home. *Ann Fam Med* 2010; 8(suppl 1): S33–44, S92.
25. Pullon S, McKinlay E, Dew K. Primary health care in New Zealand: the impact of organisational factors on teamwork. *Br J Gen Pract* 2009; 59: 191–7.
26. Pearce C, Phillips C, Hall S *et al*. Following the funding trail: financing, nurses and teamwork in Australian general practice. *BMC Health Serv Res* 2011; 11: 38.
27. Pearson ML, Wu S, Schaefer J *et al*. Assessing the implementation of the chronic care model in quality improvement collaboratives. *Health Serv Res* 2005; 40: 978–96.
28. Deneckere S, Euwema M, Van Herck P *et al*. Care pathways lead to better teamwork: results of a systematic review. *Soc Sci Med* 2012; 75: 264–8.
29. Bitton A, Schwartz GR, Stewart EE *et al*. Off the hamster wheel? Qualitative evaluation of a payment-linked patient-centered medical home (PCMH) pilot. *Milbank Q* 2012; 90: 484–515.
30. Xyrichis A, Lowton K. What fosters or prevents interprofessional teamworking in primary and community care? A literature review. *Int J Nurs Stud* 2008; 45: 140–53.