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Health Service Research

Dimensions and intensity of inter-professional teamwork in primary care: evidence from five international jurisdictions

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Abstract

Background. Inter-professional teamwork in primary care settings offers potential benefits for responding to the increasing complexity of patients' needs. While it is a central element in many reforms to primary care delivery, implementing inter-professional teamwork has proven to be more challenging than anticipated.

Objective. The objective of this study was to better understand the dimensions and intensity of teamwork and the developmental process involved in creating fully integrated teams.

Methods. Secondary analyses of qualitative and quantitative data from completed studies conducted in Australia, Canada and USA. Case studies and matrices were used, along with face-to-face group retreats, using a Collaborative Reflexive Deliberative Approach.

Results. Four dimensions of teamwork were identified. The *structural dimension* relates to human resources and mechanisms implemented to create the foundations for teamwork. The *operational dimension* relates to the activities and programs conducted as part of the team's production of services. The *relational dimension* relates to the relationships and interactions occurring in the team. Finally, the *functional dimension* relates to definitions of roles and responsibilities aimed at coordinating the team's activities as well as to the shared vision, objectives and developmental activities aimed at ensuring the long-term cohesion of the team. There was a high degree of variation in the way the dimensions were addressed by reforms across the national contexts.

Conclusion. The framework enables a clearer understanding of the incremental and iterative aspects that relate to higher achievement of teamwork. Future reforms of primary care need to address higher-level dimensions of teamwork to achieve its expected outcomes.

Key words: Evaluation studies, health care reform, inter-professional relations, policy, primary health care, qualitative research.

Introduction

Recent attempts to reorganize primary care practices have invariably included policies aiming to increase teamwork as the preferred model of primary care (1,2). This may stem from the belief that teamwork supports comprehensive management of increasing complex chronic conditions and multimorbidity to ensure coordination and integration of care (3).

Effective teamwork has been defined 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’ (4)^(p.238). Despite a relative consensus on the necessity to increase teamwork in primary care, it has proven to be challenging to implement due to poor demarcation of professional boundaries, physician autonomy and protectionist attitudes from professional organizations, limited communication within practices and the isolated nature of training curricula (5,6).

D’Amour *et al.* (7) conceptualized four dimensions of collaboration organized according to relational and organizational dimensions namely shared goals and vision, internalization, formalization and governance. They highlight that the formalization of teams relates to the extent to which documented best practices exist and are being used. Xyrichis and Lowton identified two main themes that have an impact on inter-professional teams: structure and processes (5). Bronstein identified five inter-professional processes (interdependence, newly created professional activities, flexibility, collective ownership of goals and reflection on process) and four influences (professional role, structural characteristics, personal characteristics and history of collaboration) (8). Delva *et al.* (9) identified various aspects related to effectiveness of teamwork such as the stated purpose, motivation and team goals and roles; power differences and members inclusion/exclusion; team meetings, organization and adjustment; and teamwork processes. Finally, Jain *et al.* (10) conceptualized teamwork as related to various domains: structure (team—members, roles and hierarchies; organizations—compatibility and support for teams); context (team—emotional or operational climate for members; organization—operational climate for teams); process (interdependence—defining member roles and team strategy; growth and development—aligning personal and team goals); and productivity (measures and metrics—assessing team performance; plan of action—a blueprint for team success).

While some elements are perceived to be fundamental to the implementation of teamwork, gaps in knowledge remain with regards to what constitutes highly effective teamwork in the context of varied policies and contexts. Our objective was to draw upon studies conducted in five different national and provincial contexts and reanalyse their findings to understand the dimensions of teamwork and identify factors associated with achieving various dimensions of teamwork.

Methods

This study is part of a broader study comparing and synthesizing results from empirical studies evaluating the impact of primary care reforms implemented in Australia, three Canadian provinces and the USA. We drew upon published accounts and secondary analysis of primary data from each study to generate a cross-context synthesis of peer-reviewed manuscripts from 12 mixed methods studies. The research papers included a heterogeneous mix where one or more models of primary care reform were studied, both in experimental

or natural designs. Table 1 describes the context, objectives and main components of each of the included studies.

We used a novel method called a *Collaborative Reflexive Deliberative Approach* (for detailed methods, see Crabtree *et al.*, submitted to *Family Practice*, in this issue of *Family Practice*) where a group of researchers from different contexts are brought together to reflect upon and synthesize findings from their own published and unpublished research and professional experiences. This approach draws upon the principles of participatory action research (11), narrative synthesis (12) and the realist and meta-narrative evidence synthesis using an open system approach (13). The method used the authors of the original research papers as necessary participants rather than being kept ‘at a distance’ during the synthesis process. The authors were selected based on previous publications of studies having looked at new organizational models of primary care in Australia, Canada and the USA. Not all authors from each of the studies were contacted and the group was limited to investigators that had played a central role in the identified studies.

The methodology 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 and program of research; (iii) absorbing and reinterpreting knowledge from other studies known to the investigators; and (iv) integrating insights from individual and group experiential reflections. This iterative process of reviewing and synthesizing was accomplished using monthly teleconferences and four face-to-face retreats conducted between 2010 and 2012.

We used analytic qualitative data matrices to extract the data from original papers and thematically arrange data on the implementation of teamwork innovations from the different studies. This was done through teleconferences and face-to-face investigators’ meetings. These meetings were also used to explore and challenge respective research findings and analyse how these findings were constructed and could reveal insights about team work in primary care settings. Brainstorming, pile sorting and concept mapping exercises were used to assess the qualitative and quantitative material. We conducted iterative classifying, re-extracting and analysing tasks to complete the analytic matrices.

Finally, the method involved experiential reflections. These relate to each participant’s accumulated lived experience and knowledge, both as investigator and as a person living in their particular context. Through this process, individual perspectives were publicly shared for the group to re-interpret, reflect and integrate into the final synthesis. Reflecting and integrating activities involve questioning the concordance of current findings with the new shared experiential reflections.

Results

The 12 studies included in this analysis cover a broad range of primary care reform efforts and types of primary care models. While only two focused mainly on evaluating teamwork in primary care, all of the studies contributed information about aspects of teamwork. Through the various stages of analyses and deliberative interpretation of the data, we identified four dimensions of teamwork that were addressed by the innovations and reforms of primary care: the structural dimension, the operational dimension, the relational dimension and the functional dimension.

Table 1. Overview of 12 primary care reform studies

Study title	Context	Study description
Re-order —Re-organizing the care of depression and related disorders in a primary care setting	Victoria and Tasmania, Australia	The re-order project was a longitudinal observational and participatory action research project set in six practices in Victoria and Tasmania from 2005 to 2008. 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. Phases 1 and 2 gathered the views of stakeholders about the key elements of exemplary depression care—576 patients and 300 stakeholders from clinical, academic, public and policy settings. The third phase involved working 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, <i>et al.</i> Embedding effective depression care: using theory for primary care organisational and systems change. <i>Implement Sci</i> 2010; 5: 62.; Palmer V, Gunn J, Kokanovic R, Griffiths F, Shrimpton B, Hurworth R, <i>et al.</i> Diverse voices, simple desires: a conceptual design for primary care to respond to depression and related disorders. <i>Fam Pract</i> 2010; 27(4): 447–58.]
Teamwork	Three states—Australia	The Teamwork study was a large cluster randomized controlled trial involving 60 practices in three Australian states. The intervention involved facilitation of teamwork in chronic disease management involving staff collocated within existing practices. This 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, Proudfoot JG, Crookes PA, <i>et al.</i> Multidisciplinary Team Care Arrangements in the management of patients with chronic disease in Australian general practice. <i>Med J Aust</i> 2011; 194(5): 236–9.; Christl B, Harris MF, Jayasinghe UW, Proudfoot J, Taggart J, Tan J. Readiness for organisational change among general practice staff. <i>Qual Saf Health Care</i> 2010; 19:5:e12.]
Teamlink	New South Wales, Australia	The Teamlink study was a quasi-experimental study in 34 practices in one Australian state. The intervention aimed to increase teamwork between general practice and allied health providers located outside the practice. 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. <i>Aust J Prim Health</i> 2011; 17(3): 250–8.; 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. <i>BMC Health Serv Res</i> 2010; 10:104.]
Prac-Cap	Australian states and one territory	A study of chronic disease management & general practice perspectives. [Oldroyd J, Proudfoot J, Infante FA, Powell Davies G, Harris MF, Bubner T, <i>et al.</i> Providing healthcare for people with chronic illness: the views of Australian GPs. <i>Med J Aust</i> 2003; 179(1): 30–3.; Beilby J, Holton C, Harris M, Proudfoot J, Infante F, Bubner T, <i>et al.</i> Organizational capacity and chronic disease care: an Australian general practice perspective. <i>Aust Fam Physician</i> 2007; 36(4): 286–8.]

Table 1. Continued

Study title	Context	Study description
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 interrelationship 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. <i>Health Res Policy Syst</i> 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. 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. <i>Fam Pract</i> 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. <i>Ann Fam Med</i> 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. <i>Open Med</i> 2009; 3(3): 149–64.]
Behind the Closed Door. Using ethnography to understand family health teams	Ontario, Canada	This study, set in Ontario 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. The 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 FHTs where these routine changes took hold, a significant change was triggered in the physicians' routines, facilitated by 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. <i>Fam Pract</i> 2012; 29(4): 455–61.; Russell G, Geneau R, Farrell B. <i>Final Report: Behind the Closed Door: Using Ethnography to Understand Family Health Teams (FHT) Phase II</i> . Toronto, ON: Ministry of Health and Long-term Care, 2009. Thille P, Ward N, Russell G. Self-management support in primary care: enactments, disruptions, and conversational consequences. <i>Soc Sci Med</i> 2014; 108: 97–105.]

Table 1. Continued

Study title	Context	Study description
Accessibility and Continuity of Care: a study of PHC in Québec	Quebec, Canada	This study looked at various organizational models of primary care and their influence on accessibility and experience of care users. 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. <i>Accessibility and Continuity of Care: A Study of Primary Healthcare in Québec</i> . Québec. Gouvernement du Québec; Centre de Recherche de l'Hôpital Charles LeMoine, 2009. https://www.inspq.qc.ca/pdf/publications/911_ServicesPremLigneANGLAIS.pdf (accessed on 17 August 2016).; Levesque JF, Pineault R, Provost S, Tousignant P, Couture A, Da Silva RB, <i>et al.</i> Assessing the evolution of primary healthcare organizations and their performance (2005–2010) in two regions of Quebec province: Montreal and Monteregie. <i>BMC Fam Pract</i> 2010; 11: 95.]
MaChro-1—Primary healthcare 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 dimensions of teamwork as part of the primary care reform. While some models relied on solo practice, medical group practice and other relied on multidisciplinary teams, this consisted of an natural experiment where various types of teams were implemented. [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 multi-level cohort analysis. <i>Healthc Policy</i> 2012; 8(2): e108–23.; 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. <i>Healthc Policy</i> 2009; 4(3): e159–78.]
Prevention and Competing Demands in Primary Care	Nebraska, USA	Ethnographic descriptive study of 18 practices to understand variation in quality of care. The Prevention and Competing Demands was a descriptive study using in-depth case studies of family medicine practices and discovered 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, <i>et al.</i> Delivery of clinical preventive services in family medicine offices. <i>Ann Fam Med</i> 2005; 3(5):430–5.; Crabtree BF, Miller WL, Stange KC. Understanding practice from the ground up. <i>J Fam Pract</i> 2001; 50(10): 881–7.; Miller WL, McDaniel RR Jr, Crabtree BF, Stange KC. Practice jazz: understanding variation in family practices using complexity science. <i>J Fam Pract</i> 2001; 50(10): 872–8.]
ULTRA—Using Learning Teams for Reflective Adaptation	New Jersey and Pennsylvania, USA	Practice intervention in 56 primary care practices using facilitated team-building and reflection to enhance quality of care. The ULTRA intervention study which specifically targeted the development of communication and teams using a reflective adaptive process or RAP to enhance quality of care. 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 two 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, <i>et al.</i> Using Learning Teams for Reflective Adaptation (ULTRA): insights from a team-based change management strategy in primary care. <i>Ann Fam Med</i> 2010; 8(5): 425–32.; 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.

Table 1. Continued

Study title	Context	Study description
NDP—National Demonstration Project (NDP)	USA	<p><i>Qual Manag Health Care</i> 2011; 20(1): 49–61.; Chase S, Nutting PA, Crabtree BF. How to solve problems in your practice with a new meeting approach. <i>Fam Pract Manage</i> 2010; 17(2): 31–4.; Ohman-Strickland PA, Orzano AJ, Hudson SV, Solberg LJ, DiCicco-Bloom B, O'Malley D, <i>et al.</i> Quality of diabetes care in family medicine practices: influences of nurse-practitioners and physician's assistants. <i>Ann Fam Med</i> 2008; 6(1): 14–22.]</p> <p>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 United States of a model of a particular PCMH model in a diverse sample of 36 family practices. 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. <i>Ann Fam Med</i> 2010; 8(suppl 1):S45–56, S92.; Nutting PA, Crabtree BF, Stewart EE, <i>et al.</i> Effect of facilitation on practice outcomes in the National Demonstration Project model of the patient-centered medical home. <i>Ann Fam Med</i> 2010; 8(suppl 1):S33–44, S92.; Nutting PA, Miller WL, Crabtree BF, Jaen CR, Stewart EE, Stange KC. Initial lessons from the first national demonstration project on practice transformation to a patient-centered medical home. <i>Ann Fam Med</i> 2009; 7(3): 254–60.; 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. <i>Ann Fam Med</i> 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. <i>Ann Fam Med</i> 2010; 8(suppl 1): S68–79, S92.; Crabtree BF, Chase SM, Wise CG, Schiff GD, Schmidt LA, Goyzueta JR, <i>et al.</i> Evaluation of patient centered medical home practice transformation initiatives. <i>Med Care</i> 2011; 49(1): 10–6.]</p>

The structural dimension: giving existence to the team

The *structural dimension* describes the organizational arrangements of the team, such as legal status, team composition, location, technological support and funding. This dimension was addressed by the policies that directed reforms in all the jurisdictions in which we studied reform models. Team composition was a central object of reforms, focusing on the introduction of new team members (Comp-PC/Canada; NDP/USA) and diverse team composition (Re-order/Australia). In most studies included, co-location of the members was considered a crucial structural aspect in supporting teamwork, especially in the early stages of implementation.

Several reforms also put specific funding mechanisms in place. Regarding physician remuneration, capitation intended to enable team-based care by giving an incentive to hire a nurse and pay for the physical space and some IT infrastructure (CoMPaIR/Alberta), while blended remuneration structure facilitated cooperation (Behind the Closed Door/Canada). Other contexts had explicit funding for the establishment of a multidisciplinary team or increased administrative support (Accessibility and Continuity/Canada). For others, there was little financial incentive to change the culture from operating

independently to team care (Tealink/Australia). Overwhelmingly, the studies included found that fee-for-service did not facilitate teamwork, especially with regards to interdisciplinary care.

Operational dimension: implementing tools to work together

The *operational dimension* describes the processes and mechanisms to be used to conduct activities within the team, such as guidelines, protocols and directives, meetings and collaboration, shared plans and the establishment of formal routines. The operational dimension was addressed by the policies that directed the reforms in most of the jurisdictions studied. Interdisciplinary meetings and care plans were considered a basis for coordination in many contexts. Regular scheduled meetings (Comp-PC/Canada; ULTRA/USA), daily huddles (NDP/USA) and facilitated discussions (Comp-PC/Canada) were established. At the local and regional levels, coordination of care pathways and linkage with community health centres and hospitals were crucial to promote teamwork in network models (Accessibility and Continuity/Canada).

Various tool and processes were found to positively impact teamwork. Guidelines and shared protocols (Accessibility and Continuity/Canada, MaChro-1/Canada), standing orders (medical directives)

and protocols to order tests and investigations (NDP/USA), screening tools (Re-order/Australia) and protocols for the delivery of pathways of care (Behind the Closed Door/Canada) were put in place. Formal care plans were used to spell out how clinicians would address needs and access to allied health services under Medicare (Teamwork/Australia). Some used a facilitator to support discussions at team meetings and a care plan to ensure the team was working on common goals (COMP-PC/CANADA). Several studies, though, reported that meetings were rarely held (ULTRA/USA) because meeting space or a culture of clinical meetings was lacking (Re-order/Australia).

Relational dimension: establishing routines and relationships

The *relational dimension* describes the professional and interpersonal patterns of the team, such as leadership and ownership, respect and trust, sense of belonging, team climate and the establishment of informal routines.

Communication is not just about information in written form, but also needs to be on a social/personal level (Tealink/Australia). Communication was often perceived as problematic due to time restrictions and the challenge of keeping it two-way (Behind the Closed Door/Canada). Not being fully part of the team or employed by the doctors who own the practice is a challenge. Some professionals are seen as resources, while others as part of a team. This is often influenced by their physical location and dictates the type of communication they will have (COMP-PC/CANADA). Relationships took time to develop as trust was not there from the start (MaChro-1/Canada), though others reported high levels of trust in staff and mutual respect (Behind the Closed Door/Canada). The traditional loose federation of autonomous physicians was not consistent with the sharing and ongoing learning required for continually improving patient-centred care (NDP/USA), and there was a lack of record sharing between health care professionals (Re-order/Australia).

Active facilitation was seen as key. Practice managers were seen as having a role in facilitating chronic disease management (Prac-Cap/Australia), and facilitators served as drivers for change by creating 'peer pressure' through modelling good communication. They encouraged reflection, supported momentum, provided accountability, championed respectful interactions and set the agenda for brainstorming (ULTRA/USA). The influence of champions was evident on the development of the models and on the uptake of new initiatives (Prac-Cap/Australia).

Other factors included explicit team development strategies and openness to working with and learning from other professionals (CoMPaiR/Canada). The Teamwork study involved facilitation in chronic disease management by staff co-located within existing practices. This was relatively effective in developing collaboration (especially care planning and shared information systems and some improvements in practice routines). In the Tealink (Australia) study, the intervention aimed to increase teamwork between general practitioners and allied health providers located outside the practice. In response to formal facilitation activities, there was evidence of improved referrals but there was less progress in developing trust, effective direct communication and power sharing between team members.

Functional dimension: working together in a dynamic and adaptable fashion

The *functional dimension* describes the adaptability and integration of the team, such as professional roles and scope of practice,

shared values and goals, inter-dependence and complementarity as well as the dynamic adjustments of individual actions according to the progress of the entire team. Challenges of sharing responsibilities and role definitions were addressed by some legislative reforms. Staff roles varied across practices. Some physicians preferred to keep staff (front desk, medical assistants) completely away from patient care issues, while others were more willing to involve them in patient care (ULTRA/USA). The role of nurse practitioners (NP) depended on context. The NP may take on tasks that are substituting for the MD (COMP-PC/CANADA). In other contexts, the main incentive was to balance the workloads of the GPs by extending the role of the practice nurse in chronic disease management (Teamwork/Australia).

There was variation across practices in addressing the vision and roles in interdisciplinary teams (CoMPaiR/Canada). Creating a care team required developing a shared vision of how the teams affect the patient experience (NDP/USA). In Ontario, family health teams (FHTs) with a clearly articulated vision were able to use it as a reminder that individual team members share a meaningful role in the bigger picture and how the FHT develops (Behind the Closed Door/Canada).

Physician centredness in some practices can complicate efforts at creating a team approach to care. Frequently, physicians were responsible for making the final decisions, often reported as being made with little staff input or knowledge (ULTRA/USA). The traditional hierarchy with the physician at the top, supported by the ownership of practices by general practitioners, created a powerful barrier to designing and implementing effective team care (NDP/USA). Though in other settings autocratic leadership worked because people knew where they stood (Behind the Closed Door/Canada).

Interaction between the dimensions

The empirical studies synthesized in this article highlighted that the four dimensions are not independent of each other. Efforts to address one dimension often support improvement in another dimension as well as sometimes acting in synergy to promote further level of teamwork.

Structural aspects often were perceived as a facilitator of other dimensions of teamwork. Physical proximity supports more direct collaboration of team members and allows valuable interaction and information sharing, which may not take place otherwise. However, not all collaboration requires close proximity (Comp-C) and location alone was sometimes insufficient to establish teams (PCN/Alberta). For example IT infrastructure supported teamwork by using computer software that allows health care professionals to assess and adjust for the financial impact of covering for each other (COMP-PC/Canada). The electronic medical record (EMR) also proved to be a good tool to promote complementary roles (Behind the Closed Door/Canada).

Operational aspects were mainly perceived as facilitators of the relational and functional dimensions. Regularly scheduled meeting times were established to formally support communication (Comp-PC/Canada) and allowed the practice to grow as a team (ULTRA/USA). However, issues of psychological safety emerged from meetings in which participants held very different degrees of power (ULTRA/USA).

A number of practices reported that daily huddles were an important way to model team behaviour (NDP/USA). Guidelines and shared care protocols structure team activities and are aspects that the reform models have promoted but that were also prevalent in some highly motivated organizations unrelated to

reform efforts (Accessibility and Continuity/Canada, MaChro-1/Canada). Some reforms have emphasized the need to establish standing orders and protocols for ordering laboratory tests and refilling prescriptions (NDP/USA), and to develop guidelines and protocols for teamwork and clinical provision with a focus on how to create teams (Behind the Closed Door/Canada). Some practices developed tools to support primary care organizations to implement and change their work activities (CoMPaiR/Canada). Creating care teams required breaching the traditional gap in front-back office communication by developing shared visions of how care teams affect the patient experience, having frequent front-back office meetings and retreats, and reconfiguring office work flow and patient flow across front-back office functions (NDP/USA).

Relational aspects mainly related to the functional dimension. Ensuring equitable participation, collaborative decision making and respectful interactions (CoMPaiR/Canada) during meetings were some key determinants of building inter-professional practice patterns. Few projects though, had benefitted from facilitation as a means to provide support for relational development of the team. This was a barrier for addressing the functional level. Conversely, functional aspects sometimes related to relational development. Leaders were observed in different roles (executive directors, physicians, nurses), though their leadership style set the tone for the culture (Prac-Cap/Australia).

Incremental achievement of dimensions of teamwork

The interaction between dimensions of teamwork described in the empirical studies was found to be incremental. Some dimensions, such as the structural and operational, acted more as a foundation to the establishment of the others while other dimensions were achieved at later stages and with more effort, such as the relational and functional dimensions.

Whereas the structural dimension can be easily addressed on its own, and was part of all the reform models studied in this article, for the other dimensions an incremental process seemed necessary. Structuring the team supports the development of operational tools that encourages team interaction. Clear structural arrangements and operational tools seemed to support the achievement of a team where the members relate well to each other. Finally, teams that were well-structured, that were supported with operational tools, and that developed relational cohesion, could achieve a functional state making them highly effective. The functional dimension was least often addressed by reforms, possibly because barriers arose in the other dimensions. The relational dimension was another dimension that seemed to be variably achieved. Facilitation appears to be an important factor in supporting transposing operational successes of teamwork into relational cohesion and functional effectiveness. [Figure 1](#) summarizes this incremental and iterative relationship of dimensions of teamwork.

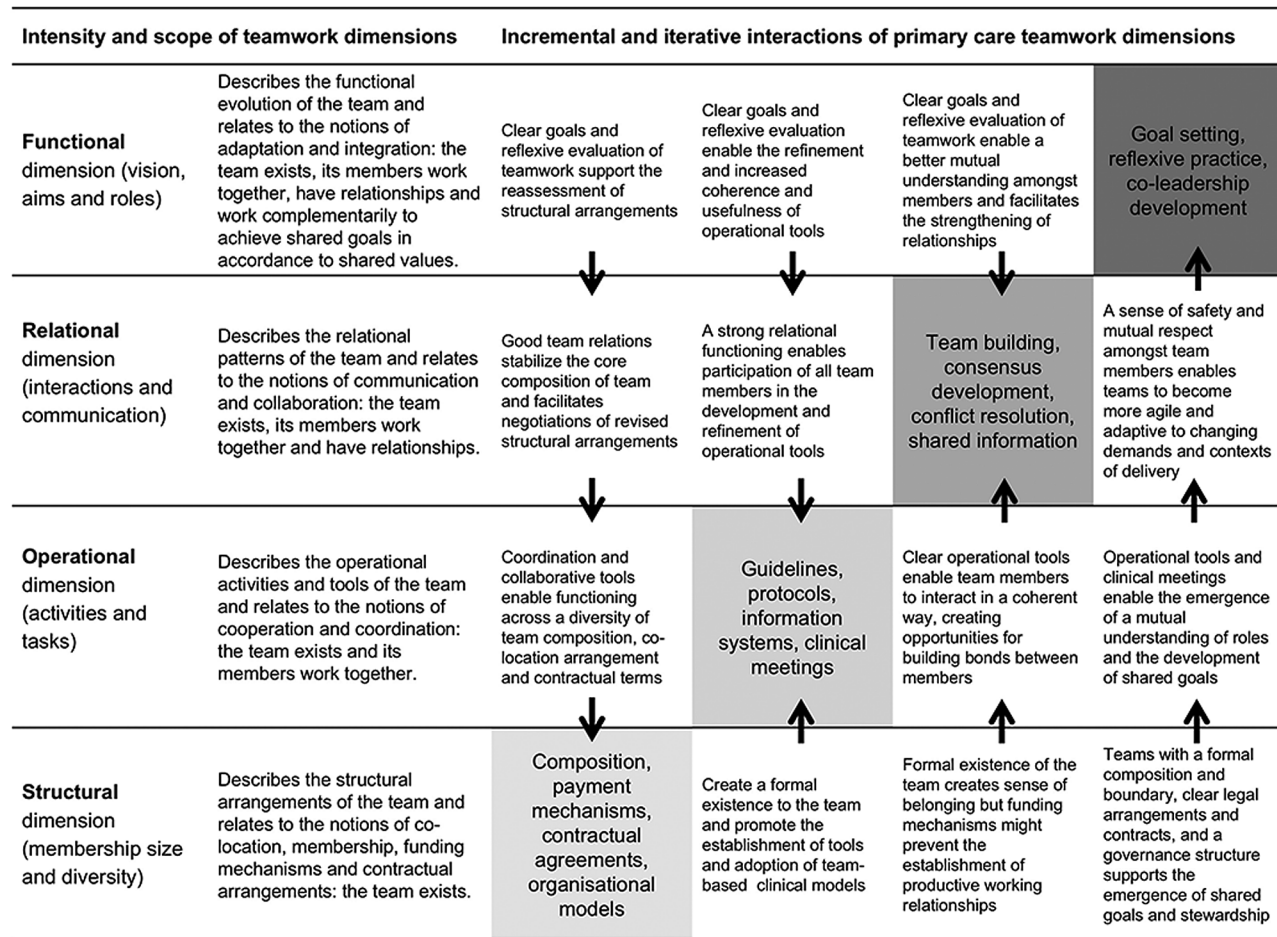


Figure 1. Matrix of dimensions and intensity of team work and interactions of dimensions

Conclusions

Traditionally, primary care practices have few structures (policies and procedures) or resources to support team function (14). Initiatives to improve inter-professional collaboration need to address the individual, practice and organizational elements of a primary care practice. The importance of developing relations in teams is prominent in the literature and requires time and gradual familiarization of members to other members and to team culture (15). Studies have also emphasized how the attitude of professionals towards the relational level are important as reluctance to work with other members and power imbalances are crucial determinants of team success (16).

But more than merely recognizing these obstacles to developing the relational dimension, interventions are required to actually develop relationships and support change of attitudes among professionals (17). Actions to enhance interdisciplinary teamwork may include the development of agreed team aims and investment in team training and the provision of time for facilitation and developmental activities, daily team huddles, team meetings, clinical operations meetings and engagement in learning collaboratives. The interdisciplinary model is based on interdependent interaction of team members. Each member may have a particular expertise, but all work synergistically towards a shared goal. Implementation of teams has been shown to require both changes to primary care staffing mix (structural integration of roles) and the development of teamwork (functional integration of roles) (18).

It has been suggested that, as teams develop, so does a sense of team identity, fostering higher levels of cohesion, member engagement, and morale, ultimately increasing team productivity (10). Various prerequisites for effective functioning of a team have been identified (a balanced team structure; a competent leader; clear operational policies; clear collaborative processes; a decision-making method; clear channels of communication; clearly defined roles, responsibilities and accountability of individual team members) supporting the notion that various dimensions of teamwork are reached incrementally (19). Simply bringing professionals together in teams does not guarantee collaboration. Practitioners also need resources and tools to support teamwork and enable teams to achieve their objectives.

The notion of differing achievement of dimensions is also supported by previous findings highlighting how structural and operational factors related to teamwork moderate the effectiveness of team training aimed at achieving a higher functionality (20). The operational function is recognized for increasing functionality as protocols and communication tools support better teamwork. Conflicts arise and can impede a higher level of team functioning; structural and operational elements can influence relational level through their impact on the emergence and resolution of conflicts.

Our four dimensions of teamwork are also supported by studies that highlight facilitators and impediments for achieving a higher level of functioning. These include: having clear measurable goals and division of labour, having the support of appropriate training and administrative systems, and consideration for the crucial impact of culture and attitude on team cohesion. Attitudes towards and experiences with team care, professional regulatory work requirements and the legal responsibility for care can all impact team functionality.

This study does present some limitations that are worth noting. First, our source studies were confined to Australia, Canada and USA and did not include any studies of team work from other countries known to have seen effort at implementing team work in primary

care such as the UK, other European countries or New-Zealand. Second, the studies included in this synthesis are not the only studies of team work in Australia, Canada and USA.

This study used a systematic deliberative process to reanalyse and triangulate data from various jurisdictions, contexts and reform types investigated in previous studies by several of our investigators. This process enabled us to iteratively produce a renewed conceptualization of teamwork in primary care.

We found four distinct dimensions of teamwork that could be addressed as part of primary care reform models. While reform efforts should ideally address all four dimensions, they were not equally addressed in the formal process of transforming primary care. The relational and functional dimensions were achieved less often and were dependent on the development of the structural and operational dimensions. Various conceptual models of collaboration in multidisciplinary care and teamwork have been suggested to structure the analysis and measurement in primary care settings. Our proposed model identifies four dimensions related to the implementation of teamwork. The expected level of teamwork should be taken into account when considering measurement tools for evaluating primary care.

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