Abstract

Team climate is a measure of health care performance. An evaluation of team climate can provide important insights into a team’s strengths and weaknesses and can help primary health care providers identify areas for improvement that can contribute to better organizational outcomes. It is measured using a team climate inventory (TCI) in primary health care practices around the globe; however, there is no work done in Canada as to whether TCI findings have been reported back to practices as audit and feedback and whether this information is useful for improving clinical performance. The purpose of this project is to determine how findings from a TCI can be reported in a practice-based performance portrait to primary health care providers and assess whether they perceive it to be easy to use and useful in improving their team climate and clinical performance. The template for the team climate section of the portrait was developed using best practices for audit and feedback and visual analytics. Feedback on the template was obtained from key stakeholders, primarily family physicians (FPs), in the Fraser East region using a short survey on perceived ease of use and usefulness. FPs who participated in this project generally agreed that the template was easy to use and provided useful information that could help them facilitate change in their practice for the purpose of improving their clinical performance. Participants identified that the information promoted self-reflection as it helped identify areas for improvement and was relevant and actionable. However, they identified that the information would be more useful if a list of easily accessible and relevant actionable items and resources for implementing change were provided. Participants also emphasized that peer comparisons would add to the usefulness of the portrait. Although the perceived ease of use and usefulness of the team climate section of the practice-based portrait were evaluated in this
project, further work is required to evaluate the actual usefulness of the reported data and the implications it has on practice and patient outcomes.
Preface

This scholarly practice advancement research (SPAR) project is a part of the TRANSFORMATION study, which seeks to improve the science and reporting of primary health care performance across Canada. The identification and proposal for the design of this SPAR project was developed collaboratively with Dr. Sabrina Wong, my SPAR supervisor and one of the Primary Investigators on the TRANSFORMATION study, and Dr. Leanne Currie, my SPAR committee member. I was responsible for developing the template for the team-climate section of the practice-based performance portrait template, developing the practice-based performance portrait feedback survey, analyzing the feedback to assess the perceived use and usefulness of the template, and revising the template according to the feedback obtained from participants under the supervision of Dr. Wong and Dr. Currie. Dr. Wong wrote the TRANSFORMATION study section in Chapter 1.
Table of Contents

Abstract ................................................................................................................................. ii
Preface ................................................................................................................................. iv
Table of Contents .................................................................................................................. v
Acknowledgements .............................................................................................................. vi

Chapter 1: Introduction ......................................................................................................... 1
   Primary Health Care .......................................................................................................... 1
   Team Climate .................................................................................................................... 7
   Health Care Performance Measurement and Reporting .................................................... 8
   Project Context .................................................................................................................. 8

Chapter 2: Background ......................................................................................................... 12
   Team Climate .................................................................................................................... 12
   Measuring Team Climate ................................................................................................. 14
   Best Practices and Considerations for Designing a Practice-Based Performance Portrait .... 19

Chapter 3: Methods ............................................................................................................... 23
   Team Climate Inventory: Psychometric Properties .......................................................... 23
   Reporting Team Climate Inventory Findings in Practice-Based Performance Portrait .......... 23
   Design and Development of Team Climate Section of Practice-Based Performance Portrait ... 23
   Presentation of Team Climate Inventory Results to Regional Stakeholder Advisory Committee and Primary Health Care Providers in Fraser East .................................................. 26

Chapter 4: Results and Discussion ....................................................................................... 28
   Team Climate Inventory Data Set ..................................................................................... 28
   Revision and Finalization of Team Climate Section of Practice-Based Performance Portrait According to Feedback from Regional Stakeholder Advisory Committee and Primary Health Care Providers in Fraser East .................................................................................................................. 28

Chapter 5: Relevance of Reporting Team Climate for Nursing ........................................... 34
   Implications of Team Climate Reports for Nursing Practice ............................................ 34

Chapter 6: Limitations .......................................................................................................... 38

Chapter 7: Conclusion .......................................................................................................... 40

Appendix A: Practice-Based Performance Portrait Feedback ............................................. 42

Appendix B: TCI Subscale Indicator Scores ......................................................................... 43

Appendix C: Initial Iteration of the Team Climate Section of Practice-Based Performance Template .................................................................................................................. 44

Appendix D: Final Iteration of the Team Climate Section of Practice-Based Performance Template .................................................................................................................. 49

Appendix E: Compare and Contrast of Different Software for Creating Practice-Based Portfolios in the Future .................................................................................................................. 54

References .......................................................................................................................... 55
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Chapter 1: Introduction

Primary Health Care

Primary health care is both a philosophy and a comprehensive model of care that is vital to improving the health of Canadians (Canadian Nurses Association, 2015) and sustaining the health care system (Health Council of Canada, 2005). Primary health care emphasizes the delivery of patient-centered care services (Canadian Nurses Association). The purpose of primary health care is to improve the health of populations throughout their lifespan (Canadian Nurses Association). The core principles of primary health care are accessibility, active public participation, health promotion and disease prevention and management, the use of appropriate technology and innovation, and inter-sectoral cooperation and collaboration (World Health Organization, 1978; World Health Organization as cited by Canadian Nurses Association).

Primary health care includes the delivery of health promotion and disease prevention services and curative, rehabilitative, and palliative care (Canadian Institutes of Health Research, 2015; Canadian Nurses Association; Smith, Van Herk, & Rahaman, 2012; World Health Organization).

Primary health care services are typically the first point of contact with the health care system and serves as the foundation of Canada’s health care system (Health Council of Canada, 2005). Primary health care services are delivered in various community settings, such as people’s residences or workplace, public health units, clinics, general practitioners’ offices, and hospices (Canadian Institutes of Health Research, 2015). Primary health care services may be
provided by a range of health care providers, including physicians, nurse practitioners, nurses, social workers, pharmacists, and/or dieticians (Canadian Institutes of Health Research). Primary health care providers are, within their scope of practice, responsible for diagnosing, treating, and/or managing episodic, acute, and chronic health conditions of individuals and populations in these settings (Canadian Institutes of Health Research; Canadian Nurses Association, 2015; The University of British Columbia, 2016).

**Team-based primary health care.** In primary health care, the term team-based care (Goldberg et al., 2013; Mitchell et al., 2012; Zygmunt, Asada, & Burge, 2015) is used interchangeably with multi-disciplinary team (Sochalski et al., 2009), inter-disciplinary team, inter-professional teams (Virani, 2012; O’Malley et al., 2014) collaborative care, family health teams, and patience-centered medical home team (The College of Family Physicians of Canada, 2011; Bleser et al., 2014; Kern et al., 2016; Reid et al., 2013) and has varying definitions. In this paper, team-based care refers to

…the provision of comprehensive health services to individuals, families, and/or their communities by at least two health care professionals along with patients, family caregivers, and community service providers who work collaboratively on shared goals within and across settings to achieve care that is safe, effective, patient-centered, timely, efficient, and equitable (Naylor et al., 2010, p. 8).

Primary health care teams typically include family physicians, registered nurses, social workers, nurse practitioners, dieticians, pharmacists, and/or practical nurses and everyone is accountable for the delivery of primary health care services to their clients (Allin & Rudoler, 2015; Health Canada, 2012).
Current organization of primary health care in Canada. In Canada, family physicians provide a majority of the community-based primary health care services (Health Canada, 2012) and serve as gatekeepers for the rest of the health care system (Allin & Rudoler, 2015; Romanow, 2002). This organization of primary health care services is problematic because it primarily focuses on diagnosing and treating diseases and injuries and impedes continuity of care, access to care, and emphasis on health promotion and disease prevention (Government of Canada, 2012). A team-based approach to delivering primary health care services is considered key to primary health care reform (Government of Canada; Health Canada). In 2003, the Canadian First Ministers’ Health Accord announced that they were committed to ensuring that 50% of Canadians had access to team-based primary health care by 2011 (First Ministers, 2003). In efforts to support provinces and territories in achieving this goal, the Government of Canada established an $800 million Primary Health Care Transformation Fund (Government of Canada, 2007). Although primary health care practices have started to implement team-based care models over the last decade (Health Council of Canada, 2009), the degree of implementation varies in each province and territory (Aggarwal & Hutchison, 2012) and most family physicians remain self-employed in private practices (Allin & Rudoler). Currently, 59% of family physicians work in a practice with other physicians, 20% work in solo-practices, 12% work in community clinics or health centers, and 4% work in hospital-based care (Canadian Institutes of Health Research & Canadian Institute for Health Information, 2016).

In the 2007-2008 Canadian Survey of Experiences with Primary Health Care, approximately 40% of Canadians self-reported that they had access to team-based primary health care (Khan, McIntosh, Sanmartin, Watson & Leeb, 2008; Jesmin, Thind & Sarma, 2012) and
there was a statistically significant difference by province or territory in access to team-based primary health care practices (Zygmunt & Berge, 2014). Residents of Prince Edward Island (52.8%) reported having the highest amount of access to primary health care teams whereas residents of Newfoundland reported having the lowest (20.6%) (Zygmunt & Berge). Comparatively, 39.5% of Ontarians, 26.3% of British Columbians, and 25.8% of Nova Scotia residents reported having access to team-based care primary health care (Zygmunt & Berge). In comparison to Ontario, residents of Prince Edward Island ($p<0.01$) are statistically significantly more likely to have access to team-based care whereas residents of Newfoundland ($p<0.01$), British Columbia ($p<0.01$), and Nova Scotia ($p<0.01$) are statistically significantly less likely to have access to team-based care (Zygmunt & Berge).

The team composition varies from practice to practice (Allin & Rudoler, 2015). This may partially be due to the fact that it has been challenging to integrate other health care providers, such as nurses, nurse practitioners, and pharmacists into community-based primary health care practices because of the financial and organizational structure (Health Council of Canada, 2005). However, because this information was self-reported, it is subject to recall bias and participants may have not been able to accurately distinguish between different members of the health care team (Khan et al., 2008; Jesmin et al., 2012); therefore, it is important that future research explore which team compositions and team care models are most effective in achieving the desired patient, organisational, and health care system outcomes (Health Council of Canada, 2009; Khan et al.) using other sources of data.

**Making the case for team-based primary health care.** The Government of Canada (2012) and Health Canada (2012) emphasize that a shift to team-based care is the key to primary health care reform in Canada because it addresses many of the shortcomings of the solo-general
practitioner model of care. The College of Family Physicians of Canada (2011) also supports team-based care. Kemp (2007) emphasizes that the availability of other health care providers in a team-based primary health care practice is beneficial because while physicians primarily address patients’ medical concerns, while other health care providers provide health promotion education, disease prevention services, and management of chronic health conditions (The College of Family Physicians of Canada) to empower patients.

Team-based primary health care has been documented to be associated with better self-reported patient care experiences. Jesmin et al. (2012), Khan et al. (2008), and Maeng, Davis, Tomcavage, Graf, & Procopio (2013) found that patients who had access to team-based primary health care reported more positive health care experiences than those who did not. Findings from the 2007-2008 Canadian Survey of Experiences with Primary Health Care show a statistically significant mean increase in access to after-hours care, follow-up coordination following a specialist visit or test, overall coordination of care, quality of care, comprehensiveness of care, delivery of health promotion and disease prevention interventions, confidence in the system and patient-centeredness between those who had access to team-based primary health care and those who did not (Jesmin et al.). However, logistic regression results show team-based care was only associated with better access to after-hours care (p<0.01), continuity of care (p<0.01), health promotion and disease prevention interventions (p<0.01), quality of care (p<0.05), confidence in the system (p<0.05), and patient centeredness (p<0.05). Team-based primary health care also contributes to reduced clinic visits and emergency room usage (Reid et al., 2013; Khan et al.; Maeng et al.). However, these findings are from self-reported data and are subject to recall bias; therefore, further research and objective data are
required to determine causal associations between team-based primary health care and actual patient health outcomes and experiences (Khan et al.; Jesmin et al.).

A team-based approach to primary health care has also been associated with better management of chronic diseases, such as heart failure (Sochalski et al., 2009) and diabetes (Campbell et al., 2001; Taylor, Oberle, Crutcher, & Norton, 2005). A literature review conducted by Sochalski et al. found that heart failure patients who received care from a multi-disciplinary team had significantly lower hospital readmissions rates and shorter length of hospital stays compared to those who did not. More specifically, a 2.9% reduction in readmission rates per month was noted and a 6.4% reduction in readmission days per month in patients who received care from a multi-disciplinary team compared to those who received care from their specialist only, 0.9% and 2.6% respectively ($p<0.001$). A randomized control trial was conducted to evaluate the nurse-physician collaborative approach compared to standard care in diabetes care management for patients diagnosed with non-insulin dependent diabetes mellitus (Taylor et al.). Although no statistically significant differences were found between the two groups, participants who received the team-based care approach showed a moderate decrease in glycosylated hemoglobin and blood pressure (Taylor et al.).

Grace, Rich, Chin, and Rodriguez (2016) argue that team-based primary health care approaches may also contribute to better primary health care performance, improved practice (clinical setting) environments, and promote readiness for change and innovation. However, despite potential and demonstrated benefits of team-based primary health care, there has been a limited amount of research evaluating the degree of collaboration between the different health care providers in these teams and how it contributes to patient and organizational outcomes (Health Council of Canada, 2005; The College of Family Physicians of Canada, 2011). This is
extremely important to examine because it is thought that “successful reform of primary health care will make better use of highly qualified health care professionals and result in a better team dynamic and partnership among providers” (Health Council of Canada, p. 5). Therefore, more research on team-based care is required to gain an insight into the different aspects that make primary health care teams effective and produce the desired patient, practice, and system level outcomes and those that do not (The College of Family Physicians of Canada).

Team Climate

Given that team-based delivery of primary health care is fairly new in Canada, it is important to measure team climate in primary health care practices. Team climate refers to a “team’s shared perceptions of organizational policies, practices, and procedures” (Anderson & West, 1998, p. 236). It can be measured using the team climate inventory (TCI) (Anderson & West; Beaulieu et al., 2013; Bower, Campbell, Bojke, & Sibbald, 2003; Brown, Ryan, Thorpe, Markle, & Hutchison, 2015; Goh & Eccles, 2009; Hann, Bower, Campbell, Marshall, & Reeves, 2007; Howard, Brazil, Akhtar-Danesh, & Agarwal, 2011; Proudfoot et al., 2007). The TCI measures four dimensions of team-functioning: participative safety, support for new ideas, task orientation and vision (Anderson & West) using Likert scales which provide data on participants’ viewpoints (Polit & Beck, 2012) about their practice’s team climate. An evaluation of team climate can provide important insights into a team’s strengths and weaknesses (Loo, 2003) and can help primary health care providers identify areas for improvement that can contribute to better organizational outcomes. Positive team climates have been reported to contribute to job satisfaction, better self-reported team effectiveness, patient satisfaction with care, and innovation (Bower et al.; Proudfoot et al.).
Health Care Performance Measurement and Reporting

Health care performance measurements at the professional, practice/organizational, local, regional, provincial and/or national level(s) are pertinent for evaluating the impact of health services planning, management and quality improvement activities and promoting accountability (Aggarwal & O’Shaughnessy, 2014). Therefore, it is important to ensure that information on the team climate of a practice is reported back to that practice. Audit and feedback may be an effective strategy for reporting this information back to key stakeholders so that they can monitor their performance and progress towards the desired patient, professional, or organizational outcomes. Audit and feedback refers to “any summary of clinical performance of health care over a specified time period” (Jamtvedt, Young, Kristoffersen, O’Brien, & Oxman, 2006, p. 433). Two systematic reviews on audit and feedback concluded that reporting back what practices or health care providers do as audit and feedback can be effective in changing clinical performance (clinical practice); but, the effects have been variable (Jamtvedt et al., 2006; Jamtvedt, Young, Kristoffersen, O’Brien, & Oxman, 2007). Some of the factors that contribute to this variability include feedback content, type, intensity, source, and delivery format and characteristics of the recipient (Jamtvedt et al., 2006, 2007; Grol & Grimshaw, 2003). Visual analytics is recognized as one of the best approaches for exploring, understanding, and communicating data and providing clinical performance feedback while considering these factors (Keim, Mansmann, Schneidewind, Thomas, & Ziegler, 2008; Yau, 2011).

Project Context

TRANSFORMATION study. This scholarly practice advancement research (SPAR) project is part of the TRANSFORMATION team grant (Wong et al., 2013; The University of British Columbia, 2016). The TRANSFORMATION study seeks to improve the science and
reporting of primary health care performance across Canada. There are three socio-demographically similar regions, which serve as the study sites: Fraser East, British Columbia; Eastern Ontario, Ontario; and Central Zone, Nova Scotia. This study consists of four conceptually linked studies, one of which is a primary care practice-based survey, which collects survey data from multiple independent practices in each study site. The practice-based survey consists of linked organizational, provider, and patient (n=20 patients per practice) data. The TRANSFORMATION study makes the first effort in Canada to create a comprehensive primary health care information infrastructure by using and linking data on performance indicators using the best sources of data for each dimension. The information infrastructure in TRANSFORMATION consists of a practice-based survey linked to health administrative data, deliberative dialogues with patients and case studies that include policy document review, interviews with key informants and separate focus groups with clinicians and patients. TRANSFORMATION then seeks to create a practice-based performance portrait to report this information back to primary health care providers.

This SPAR project draws on the organizational and provider data where the TCI was collected. The organizational survey provides data on team functioning where all staff were asked to fill out the team climate inventory (TCI). The organizational survey was administered by TRANSFORMATION between 2015 and 2016. This SPAR project focuses on how team climate, a measure of primary health care performance, can be reported to primary health care providers.

Recruitment of practices. Practices, providers and staff, and patients were recruited to participate in TRANSFORMATION. Since this SPAR project only uses the organizational and provider surveys, the practice recruitment and procedures for collecting these data are reported
here. Initial sampling for TRANSFORMATION was individual family physicians, identified by a regional list that the study developed using publicly available data sources (e.g., BC College of Physicians and Surgeons website) in conjunction with the regional stakeholder advisory committees. In group practices, up to five primary health care providers who deliver comprehensive general medical care to patients were recruited. The physician had to be part of the practice for at least one year and identify that practice as their "principal clinical practice". While the initial sampling frame was family physicians (FPs), nurse practitioners (NPs) were also eligible to be a provider participant at a practice, on the condition that they meet the criteria of providing generalized care and have their own patient panels.

Through the family physicians or the practice receptionist, contact information was obtained to recruit the organizational lead of each practice. Providers were contacted through a letter, face-to-face, or by email. In all cases recruitment introduced the project Practices were also recruited through special events held in each region (e.g., Division of Family Practice meetings, billing workshops, etc.). All organizational leads, the provider, and identified staff were sent a link to an electronic survey—which either contained the organizational survey, a team climate inventory, or the provider survey.

**Problem statement.** Although the TCI has been used to measure and evaluate team climate in primary health care practices around the globe (Anderson & West, 1996, 1998; Beaulieu et al., 2013; Bower et al., 2003; Brown et al., 2015; Campbell et al., 2001; Goh & Eccles, 2009; Hann et al., 2007; Howard et al., 2011; Kivimaki, Kuk, Elovainio, Thomson, Kalliomäki- Levento, & Heikilä, 1997; Mathisen, Einarsen, Jorstad, & Bronnick, 2004; Proudfoot et al., 2007; Poulton & West, 1998); only three research groups (Beaulieu et al.; Brown et al.; Howard et al.) have assessed team climate in Canada which all took place in
Eastern Canada (Ontario and Quebec). These studies took place only in Eastern Canada (Ontario and Quebec). There is no work done in Canada as to whether TCI findings have been reported back to practices as audit and feedback and whether this information was useful for improving clinical performance. There is also some ambiguity about how to best report the TCI scores.

**Goals and objectives.** The purpose of this project is to examine whether or not reporting the TCI is important to clinicians, how to best report TCI scores to develop the team climate section of a practice-based performance portrait using visual analytics and Grice’s principles of cooperation (Coiera, 2003). Also, given that there is no evidence of findings from TCIs been reported or have not been documented to be reported back to primary health care practices as audit and feedback, this project will also assess the perceived ease of use and perceived usefulness of the team climate section of the practice-based performance portrait.

**Significance.** This SPAR project specifically focuses on how team climate can be reported to primary health care providers. This project is unique in the sense that it will be the first to look at how findings from a TCI can be presented and communicated to primary health care practices in a manner that they perceive to be useful in improving their team climate to ultimately improve their clinical performance. This project will help inform how the TCI can be reported to key stakeholders in future performance measurement reports and whether primary health care providers perceive this information to be useful or not.
Chapter 2: Background

Team Climate

Team climate is a performance measure that is indicative of how well an organization is functioning (Snow, 2002). Team climate refers to a “team’s shared perceptions of organizational policies, practices, and procedures” (Anderson & West, 1998, p. 236). Four broad dimensions characterize team climate: team objectives, participative safety, task orientation, and support for new ideas (Anderson & West). “Vision is an idea of valued outcome which represents a higher order goal and a motivating force at work” (Anderson & West, p. 240).

Team objectives. A team’s vision is often reflected in their team objectives. The four attributes of team objectives are clarity, visionary nature, attainability, and sharedness (Anderson, & West, 1996, 1998). Clearly articulated and shared objectives help team members provide direction and value to their work, which can enhance organizational performance (Hülsheger, Anderson, & Salgado, 2009). Clarity of and commitment to team objectives is key in predicting the overall effectiveness of primary health care teams, particularly will patient-centered care, health care practice, organizational efficiency (Poulton & West, 1998). Poulton and West argue that primary health care teams that have clear shared objectives and who are committed to achieving them are more open to innovation and change and more likely to effectively deliver health care services.

Participative safety. Participative safety refers to how safe, comfortable and motivated team members feel participating or engaging in decision-making, sharing new ideas, and interacting with colleagues (Anderson & West, 1998). A safe and comfortable team environment is characterized by trust and mutual support (Hülsheger et al., 2009). When team members feel comfortable, they demonstrate greater motivation and commitment to their work.
and share new ideas (Hülsheger et al.). Participative safety has been identified as the best predictor for the number of innovations a team implements (Anderson & West, 1998). In other words, greater participative safety is associated with a higher number of new ideas and innovations being implemented (Anderson & West, 1996, 1998).

**Task orientation.** Task orientation refers to a team’s commitment to improve the quality of task performance in relation to the team objectives (Anderson & West, 1998). Task orientation emphasizes accountability and is characterized by constructive evaluations, feedback and appraisal of each others’ ideas and performance (Anderson & West; Rose & Schelewa-Davies, 1997; Hülsheger et al., 2009). Task orientation is important for improving team effectiveness and outcomes (Hülsheger et al.).

**Support for new ideas.** Support for new ideas is “the expectation, approach and practical support of attempts to introduce new and improved ways of doing things in the work environment” (Anderson & West, 1998, p. 240). It encompasses both articulated and enacted support (Anderson & West; Hülsheger et al., 2009). Articulated support refers to the verbal or written articulation of a new practice or policy whereas enacted support refers to the process of actively engaging in the implementing and adhering to a new practice or policy with the appropriate resources (Anderson & West).

**Knowledge gaps in team climate.** The literature reveals mixed findings about the association between team size and team climate. Team size has been reported to be both negatively correlated (Poulton and West, 1998; Proudfoot et al., 2007; Gonzalez-Roma, Fortes-Ferreira, & Peiro, 2009) and not correlated at all (Howard et al., 2011) with team climate dimension scores. Smaller primary health care team sizes have been found to have better team climate dimension scores, especially when there are less clinical staff on the team (Proudfoot et
al.). Work is needed to examine whether different primary health care team compositions are associated with team climate. Campbell et al. (2001) reported team climate to be associated with diabetes care management; however, Hann et al. (2007) did not find a similar association.

**Measuring Team Climate**

**Team climate inventory.** The team climate inventory (TCI) is a valid and reliable tool that is used to measure and assess team climate (Anderson & West, 1998) or team effectiveness (Canadian Institute of Health Information, 2012). The original TCI consists of 65-items (Anderson & West); however, various short-versions of the TCI have been developed and evaluated for reliability and validity and used in research studies. Five versions of the TCI survey are available for use; they contain either 65 (Bower et al., 2003; Hann et al., 2007), 44 (Loo, 2003; Mathisen et al., 2004; Proudfoot et al., 2007; ); 38 (Poulton & West, 1998; Campbell et al., 2001; Kivimäki et al., 1997; Agrell & Gustafson, 1994), 19 (Beaulieu et al., 2013; Beaulieu et al., 2014a) or 14 (Howard et al., 2011; Brown et al., 2015) items. Some of these TCIs have been translated and have shown to be reliable and valid in various languages including, English (Anderson & West; Beaulieu et al., 2013), Norwegian (Mathisen et al.), Swedish (Agrell & Gustafson), Finnish (Kivimäki et al.), Dutch (Strating & Nieboer, 2009), and Italian (Ragazzoni, Baiardi, Zotti, Anderson, & West, 2002).

An assessment of team climate can provide important insights into a team’s strengths and weaknesses (Loo, 2003) and can help primary health care providers identify areas for improvement that can contribute to better organizational outcomes. Positive team climates have been reported to contribute to job satisfaction, better self-reported team effectiveness, patient satisfaction with care, diabetes care management, and innovation (Campbell et al., 2001; Bower et al., 2003; Proudfoot et al., 2007), as well as, access to and continuity of care (Campbell et al.).
Hann et al., 2007 found group culture to be positively associated with team climate. However, Bower et al. found that primary health care practices that receive deprivation payments, which are compensatory payments for the primary health care practice’s presumed extra workload (Carr-Hill & Sheldon, 1991), were less likely to complete the TCI.

**Reporting Team Climate**

There is some ambiguity around how TCI scores are calculated, used for analysis, and reported. While most research reports provided an sub-dimension scores out of 5 for team objectives, task orientation, participative safety, and support for innovation (Loo, 2003; Proudfoot et al., 2007; Howard et al., 2011), some reported to have used and/or provided an overall TCI score out of 5 (Beaulieu et al., 2014; Brown et al., 2015). Hann et al. (2007) calculated and reported TCI scores using a points system out of 100 by summing up subscales. Some of the research articles did not provide any TCI dimension or overall TCI scores (Anderson & West, 1996, 1998; Kivimaki et al., 1997; Eisenbeiss, Boerner, & van Knippenberg., 2008; Gonzalez-Roma et al., 2009).

There is no evidence of whether TCI findings were formally reported back to practices as audit and feedback and whether this information was useful for improving clinical performance. However, following a case study comparing two senior management teams in the British National Health Service, Anderson and West (1996) generally noted that the two teams found the feedback on their TCI profile to be useful but they did not provide any specific details on how or why the participants were uncomfortable (Anderson & West). Therefore, it is important to be conscious of how TCI results are reported back to teams or practices (Anderson & West).
Audit and Feedback

In order to function effectively, all primary health care providers, teams, and organizations need accurate and timely feedback about their performance (Mickan & Rodger, 2000). Therefore, audit and feedback may be an effective strategy for reporting data obtained from TCI back to primary health care practices. Audit and feedback refers to “any summary of clinical performance of health care over a specified time period” (Jamtvedt et al., 2006, p. 433). Audit and feedback can be useful for helping primary health care providers identify priority outcomes, assessing effectiveness of strategies and/or policies they have implemented to evaluate what’s been working and what has and encourage them to try alternative approaches to improve outcomes, and it promotes accountability (O’Toole, Cabral, Blumen & Black, 2011; Johnston et al., 2011). This process can serve as a driver for innovation (O’Toole et al.). The overall purpose of audit and feedback is to provide health care professionals with an assessment of their performance so that they can monitor and reflect on their clinical performance to implement changes that will help them progress towards desired patient, professional, or organizational outcomes (Flottorp, Jamtvedt, Gibis, & McKee, 2010).

Primary health care physicians have indicated that the provision of audit and feedback reports to both family physicians and their team members not only influences their own clinical performance and team effectiveness (O’Toole et al., 2011) but also helps boost the team’s capacity for quality improvement (Johnston et al., 2011). Johnston et al. conducted a mixed method study to investigate the acceptability and influence of team performance data to primary health care teams. Team feedback using performance data was widely accepted by participants from all the disciplines and it was perceived to be useful, necessary, and potentially motivational (Johnston et al.). Participants identified that the feedback has the potential to shape team
culture/attitudes, support the development of shared goals and understanding of performance standards, and influence the team’s ability to change clinical performance by bringing people together to focus on performance (Johnston et al.). However, participants were unclear about who was responsible for using the information to initiate clinical performance changes, which is a significant barrier to clinical performance improvement (Johnston et al).

Two systematic reviews on audit and feedback concluded that reporting back what practices or health care providers do as audit and feedback can be effective in improving clinical performance; however, the effects have been variable (Jamtvedt et al., 2006, 2007). Feedback tends to be more effective when it is provided by an individual in greater authority (e.g., supervisor) or respected colleague, is provided regularly, includes specifics goals and strategies, aims to reduce specific behaviours, and recipients are non-physicians (Ivers et al., 2014a). Some of the factors that contribute to the variability in the effectiveness of feedback include feedback content, type, intensity, source, and delivery format and characteristics of the recipient (Jamtvedt, et al, 2006, 2007; Grol & Grimshaw, 2003). Physicians expressed that audit and feedback containing standardized targets for populations conflicted with patient-centered care because they feel this approach promotes disease-oriented decision-making instead of patient oriented decision-making despite the evidence (Ivers et al., 2014).

**Best practices and considerations for audit and feedback.** Traditionally, audit and feedback has focused on the provider’s clinical performance; however, with the implementation of team-based care models, different approaches to audit and feedback may be required (Hysong, Knox, & Haidet, 2014). Performance feedback to physicians and primary health care teams can serve as a measure of team effectives and allows all primary health care team members to evaluate their team’s strengths and weaknesses (O’Toole et al., 2011). Hysong et al.
implemented a team-based audit and feedback approach and found that physicians perceived audit and feedback tools to be more useful when another team member, especially nurses, were available to monitor and manage their practice information. This may have been influenced by the fact that nurses were able to identify clinical performance measures that need to be improved within the practice, screen blood work results (ex., HA1c) to identify patients who required further care to manage their condition or disease (ex., diabetes), and were able to engage in shared discussions and planning patient care (Hysong et al.). However, despite providing audit and feedback to the team, the responsibility of the clinical performance remained largely with the provider (Hysong et al.). Future research should explore the nuances of team-based audit and feedback to support team-based care and the practice’s objective (Hysong et al.).

Storme (2014) asserts that the usefulness of a health care organization’s performance data depends on its accuracy, timeliness, relevance, analysis, and visualization that is directed at the appropriate end user, not the medium through which the information is presented. When reporting information, data sources should be provided to promote credibility (Yau, 2011; Storme). Hysong, Best, and Pugh (2006) found that timeliness, individualized, non-punitive, and customizable audit and feedback was more meaningful and actionable for health care providers. For physicians, the value of performance feedback reports is highly influenced by timeliness (Agency for Healthcare Research and Quality, 2012). Timeliness refers to how frequently health care providers receive up-to-date data and feedback (Agency for Healthcare Research and Quality; Hysong et al.). The Agency for Healthcare and Quality recommends updating data and providing performance feedback at least four times a year. Individualization refers to the degree to which health care providers received feedback about their performance, not aggregated team-based data (Hysong et al.). Respondents identified that the delivery feedback in a non-punitive
manner resulted in greater adherence to clinical practice guidelines (Hysong et al.). Respondents identified that feedback should be customizable, so that they are able to view their performance data based on their needs, which engages the individual to be an active participant and makes the feedback more meaningful and useful for their practice and clinical performance (Hysong et al.). Comparative performance evaluations that include peer-rankings with colleagues have been found to be a driver for change and innovation (O’Toole et al., 2011).

**Best Practices and Considerations for Designing a Practice-Based Performance Portrait**


**Grime’s principle of cooperation.** Clinical data can be communicated in various formats and mediums (Coiera, 2003). Poorly presented data can result in poorly informed clinical decisions and actions (Coiera; Wyaat and Wright, 1998). According to Coiera, what a clinician understands after seeing the data in a patient record and what the data actually show are very different things. Information can be misunderstood as a result of limitations of the sender and receiver of the information as every individual has slightly different knowledge, perceptions, attention limitations, and biases (Coiera). Grice (1975) proposed the cooperative principles for basic effective communication. Coiera argues that in health communication, Grice’s principle of cooperation is a “professional necessity.” Grice’s principle of cooperation is defined by 4
maxims: the maxim of quantity: say only what is required; maxim of quality: express the truth; maxim of relevance: say what is pertinent, and the maxim of manner: be clear and concise (Grice; Coiera). The maxim of quality asserts that individuals should only communicate what is needed and this should be communicated in a concise manner (Grice; Coiera). The maxim of quality emphasizes making your contribution one that is true and supported by evidence (Grice; Coiera). In terms of communicating data as audit and feedback, data consists of facts, which are observations or measurements about the world and are credible when properly cited (Strome; Yau). The maxim of relevance highlights saying only what is pertinent in the context (Grice; Coiera). The maxim of manner suggests avoiding obscurity and ambiguity and being brief and orderly (Grice; Coiera).

Visual analytics. The use of visual analytic tools and techniques is one of the best ways to explore, understand, synthesize, and communicate data from large data sets and provide performance feedback for effective performance understanding, reasoning, and decision-making (Keim, Mansmann, Schneidewind, Thomas, & Ziegler, 2008; Yau, 2011). Visual analytics is described “as the systems, tools, and techniques that help HCOs [health care organizations] gain insight into current performance, and guide future actions, by discerning patterns and relationships in data and using that understanding to guide decision making” (Strome, 2014, p.5). This is definition is echoed in Keim et al.’s description of visual analytics as well. Data serve as the core of visual analytics (Keim et al.; Yau). Overall, visual analytics can provide useful insight into past, present, and future performance to health care providers, teams, and organizations that “require better insight into their own operations, transparency across boundaries, and accountability for their performance” (Strome, p.15).
Principles of visual analytics. Visual analytics is not just about the presentation; it is about making data readable, understandable, and usable while highlighting key findings (Strome, 2014). The foundation of visual analytics is that the data are coded and presented in a manner that permits the reader to recode the visualizations (e.g., shapes, shades, etc.) back into numbers (Strome; Yau, 2011). Therefore, encoding is a visual translation and decoding allows individuals to see data from different perspectives and find patterns that would not otherwise be visible when looking at data in tables or spreadsheets (Strome; Yau). These encodings are usually straightforward visual cues because they are based on mathematical rules (Yau). For example, longer bars represent higher value than smaller ones (Yau).

Wright, Jansen, and Wyatt (1998; Coiera, 2003) identify 6 principles of information design to reduce clinical errors related to data interpretation. The first principle emphasizes providing users with the context and purpose of the information design (Wright et al.; Coiera). This is important because one cannot assume that the user/reader knows everything about the data as the designer/researcher does (Yau, 2011). The second and third principles suggest providing informative headings to help with retrieval of information and interpretation along with concise information under each heading to promote easy data usage (Wright et al.; Coiera). Providing a brief title, description, or explanation about the information or visual displayed can help the user understand the information or message being conveyed (Yau). A visual should also be accompanied by a legend or brief explanations to provide the reader with context and to promote understanding (Strome, 2014; Yau). When relaying a message, a sender must consider the receiver’s knowledge about the content and context of the message (Coiera). Therefore, the message should be simple and avoid jargon to be effective (Coiera). The fourth and fifth principles emphasize including signs to indicate location of information and organizing
information in a manner that meets the needs of more than one profession (Wright et al.; Coiera). The sixth principle suggests explicitly organizing material visually (Wright et al.; Coiera).

Strome refers to this as construction, and it involves consideration of font size, color, scaling, and spacing. The choice of color in visual analytics can play a significant role in conveying a message (Yau). It can evoke an emotional response, provide context, or completely change the meaning of the message intended to be conveyed by data visualization (Yau).

However, prior to proceeding to choosing the visualization, one needs to prepare the data for visual analytics (Strome, 2014; Yau, 2011). This requires knowledge of what the data represent, data storage (e.g., where and how to obtain data), attributes of the data (e.g., are the data continuous or categorical), and how the data can be turned into useful information (Strome).

When deciding which visual to use, there are two important considerations: the message to be communicated and the audience (Strome; Yau). The selected visual should complement both the message to be conveyed and the audience (Strome; Yau). These considerations align with What-Why-How framework for visual analytics described by Munzner (2014). This framework considers what data the user will see, why the visual tool is chosen, and how the visual encoding is developed in relation to the visual design (Munzner).
Chapter 3: Methods

Team Climate Inventory: Psychometric Properties

The 19-item TCI administered at participating primary health care practices by TRANSFORMATION has been tested for reliability and validity in English (Beaulieu et al., 2013) and in French (Beaulieu et al., 2014). The 19-item TCI consists of four team-functioning scales: participative safety, support for new ideas, task orientation and vision. Likert scales were used to collect data on participant’s viewpoints about their team climate (Polit & Beck, 2012). Indicators of participative safety (6 items, Cronbach’s α 0.84) and support for new ideas (5 items, Cronbach’s α 0.81) were measured using 5-point Likert scales (1= strongly disagree to 5= strongly agree). Items of team objectives (4 items, Cronbach’s α 0.86) and task orientation (4 items, Cronbach’s α 0.84) were measured using 7-point Likert scales (1 = not at all/ to a very little extent to 7 = completely/to a very great extent). The average score for participative safety and support for new ideas and its subscales were calculated and reported out of 5. Subscale scores and overall scores for team objectives and task orientation were calculated out of 5 by multiplying the average out of 7 by 5/7 to standardize the scale of all team climate dimensions and report shared perception scores. A higher shared perception score was assigned to those agreeing with the statement (Polit & Beck), therefore, the higher the score, the stronger the team’s shared perception.

Reporting Team Climate Inventory Findings in Practice-Based Performance Portrait

Although a 30% response rate is considered to be a good rate (Dawson, 2003; Borrill & West, 2001), it is problematic when the group is small (Dawson). Therefore, when there are
small groups, the aggregate or the mean of individual responses is often calculated to form group level variables (Dawson). The sampling ratio, which is the standard error of the mean to group variance \((N-n)/Nn\), is then used to determine the reliability of the data (Dawson). \(N\) is the total number of people in the practice and \(n\) is the number of participants who completed the TCI at the practice (Dawson). Ideally the sampling ratio should be as small as possible, preferably less than 0.24, because it more accurately reflects a situation if responses are random and has shown reliability of at least 0.90 (J. Dawson, personal communication, July 29, 2015). However, if response bias is present, then a response rate of 100\% is required to ensure validity of the data (J. Dawson, personal communication). Therefore, TCI scores were only calculated and reported to practices if the sampling ratio \((N-n)/Nn\) was less than 0.24.

**Design and Development of Team Climate Section of Practice-Based Performance Portrait**

The template for the team climate portion of the practice-based portrait was developed using the What-Why-Where framework (Munzner, 2014), Grice’s (1975) principle of cooperation (Coiera, 2003) and Wright et al.’s (1998) 6 principles of information design as no literature was found pertaining to how to report or provide audit and feedback on team climate to organizations was found.

**Application of the What-Why-Where framework.** The What-Why-Where Framework was used to guide the visual analytics used to report TCI results (Munzner, 2014). This framework considers three questions for visual analytics (Munzner): what data the user sees, why the user intends to use a visual analytic tool, and how the visual encoding will be constructed (Munzner). In the team climate section, the shared perception scores for each team climate dimension were reported so that clinicians could identify the strengths and areas for
improvement in their practice’s team climate and ultimately use their strengths to improve their weaknesses. Family physicians and nurse practitioners are busy attending to patients and therefore, may be resistant to investing a lot of time and effort into decoding complicated visual analytics in a report (Agency of Healthcare Research and Quality, 2012). Thus, encodings should be straightforward visual cues based on mathematical rules (Yau, 2011) and embedded in commonly used visuals, such as bar graphs (Strome, 2014). In the practice-based portraits, bar graphs were used to display the shared perception scores because it is easy to recognize and understand that longer bars represent higher values or higher team function (Strome).

**Application of Grice’s principle of cooperation.** Grice’s (1975; Coiera, 2003) principle of cooperation was applied to communicate information about team climate to practices. As discussed in the last chapter, Grice’s principle of cooperation is defined by 4 maxims: the maxim of quantity: say only what is required; maxim of quality: express the truth; maxim of relevance: say what is pertinent, and the maxim of manner: be clear and concise (Grice; Coiera). These principles were applied by providing a brief, clear and concise description of each team climate dimension which was followed by the reporting of single TCI items pertaining to that particular team climate dimension for the purpose of being transparent about how each dimension was measured and defined. TCI subscale and dimension scores were calculated and reported using data collected by the TCI survey administered by the TRANSFORMATION team. This information was clearly stated in the ‘About this Report’ section to promote credibility of findings.

**Application of principles of visual analytics.** Wright et al.’s (1998; Coiera, 2003) 6 principles of information design were applied to design and develop the team climate section of the practice-based performance portrait. The first principle of providing participants with a
context was applied by developing an ‘About this Report’ section along with an introduction page to the team climate section. The use of concise, but informative headings for each subheading under the team climate section demonstrates the application of the second and third principles of information design. Icons were used in addition to headings to mark the different team climate dimensions. An attempt was made to logically organize the team climate dimensions when reporting them. The team climate reflected some of the characteristics of the different phases of the group life cycle: forming, storming, norming, and performing (Arnold, 2007). The team climate dimensions were reported in the following order: team objectives, participative safety, task orientation, and support for new ideas. An effort was also made to avoid jargon and provide definitions to ensure that the language used in the report was clear and simple to understand because not all end-users of this portrait may be physicians. End-users may include administrative or clerical staff, nurses, and/or managers.

Presentation of Team Climate Inventory Results to Regional Stakeholder Advisory Committee and Primary Health Care Providers in Fraser East

The involvement of key stakeholders in the design and development of interventions is valuable the fidelity of any intervention (Polit & Beck, 2012). Key stakeholders are individuals “who have a stake in the intervention” (Polit & Beck, p. 637). Stakeholders can provide insightful feedback that can be useful in tailoring the intervention to the needs of the target population, help recruit and retrain participants, and ensure that an intervention receives a reasonable and unbiased test amongst their colleagues (Polit & Beck). The Agency for Healthcare Research and Quality (2012) also suggests working with stakeholders who are the intended end-users to design and develop practice performance reports.
Feedback on the initial drafts was obtained from a physician working closely with the
TRANSFORMATION team. Feedback was then obtained from members of the Regional
Stakeholder Advisory Committee and Fraser East family physicians using a short survey (see
Appendix A) to better tailor the practice-based performance portraits to the needs of clinicians.
The survey was developed using the concepts perceived ease of use and perceived usefulness for
the team-climate portion of the practice-based portrait. Davis (1989) indicates that information
technology has the potential to improve the performance of individuals with white-collar jobs.
Perceived usefulness and perceived ease of use are considered the most important determinants
of user acceptance of technology and information reports (Davis; Legris, Ingham, Collerette,
2003). Perceived usefulness is defined as, “the degree to which a person believes that using a
particular system would enhance his or her job performance,” whereas perceived ease of use
refers to, “the degree to which a person believes that using a particular system would be free of
effort” (Davis, p. 320). An information system or report that is more likely to be used if it is
perceived to be easy to use (Davis). Additional feedback was sought by asking participants what
they liked best and what could be done differently to improve the reporting of this information.
The feedback was reviewed and used to revise the team climate section of the practice-based
performance portrait.
Chapter 4: Results and Discussion

Team Climate Inventory Data Set

The preliminary TCI data set included TCIs from 12 family practices in Fraser East. One practice did not have any TCIs completed and another did not meet the criteria for calculating and reporting TCI results. TCI response rates from the remaining 10 family practices varied from 44% to 100%. The average score on the team objectives scale for family practices was 3.7 while the scores ranged from 1.9 to 4.6. The average score on the participative safety scale for these practices was 4.0 while scores ranged from 2.7 to 4.8. The average score on the task orientation scale was 3.7 with scores ranging from 2.3 to 4.4. The average score on the support for new ideas scale was 3.8 while scores ranged from 2.5 to 4.3. Appendix B contains Table 1, which displays the average score and range of scores for each indicator within each team functioning scale.

Revision and Finalization of Team Climate Section of Practice-Based Portrait

According to Feedback from Regional Stakeholder Advisory Committee and Primary Health Care Providers in Fraser East

Feedback received from the Regional Stakeholder Advisory Committee and family physicians in Fraser East was reviewed and the team climate section of the practice-based performance portrait were revised and finalized accordingly.

Feedback from Regional Stakeholder Advisory Committee. The initial draft of the team climate section of the practice-based performance portrait (see Appendix C) was presented at the Regional Stakeholder Advisory Committee. Four members of the Regional Stakeholder Advisory Committee attended the meeting in person and 1 member joined the meeting by phone. Although participants did not complete the surveys provided for feedback, the team climate
section of the practice-based performance portrait was discussed as a group. There was general consensus among the group that the TCI section of the portrait was useful.

One participant shared that although the team climate section of the practice-based performance portrait contained a lot of information, he felt that the information would be useful for his practice and clinical performance. He expressed that the information promotes self-reflection and encourages him to think how he can improve particular aspects of his practice’s team climate. Findings from the TCI can promote critical self-reflection about one’s relationship with the team and perceptions about their team climate, which is essential before one can initiate actions to change their behaviour within the team and improve team climate (Loo, 2003).

Another participant shared that the values reported in the TCI section of the portrait may not accurately reflect the values of the practice because of the way the question was asked on the organizational survey. The participant expressed that the question that asked participants to identify their clinic’s vision on responsibility for health only allowed participants to choose either from the following: health is mostly an individual responsibility; it is up to each individual to maintain his or her health or do what it takes to improve his or her health or health is mostly a collective responsibility; it is up to society to create conditions that help maintain or improve health was problematic. The participant felt that the question did not accurately reflect the values of his practice because as the question only allowed participants to choose from two extreme responses that either reflected a strong republican or democratic view. Therefore, upon reflecting on the question in the organizational survey and the feedback provided, it was decided not to report this information back to practices and to remove it from the portrait.

The committee indicated that the practice-based performance report would be more useful if primary health care providers were able to compare their scores with primary health
care providers in Fraser East and/or other clinics participating in the study. The Agency for Healthcare Research and Quality (2012) reports that peer comparisons are very important in clinical performance feedback reports if the intention of the report is to change physician/clinician behaviour. Primary health care providers have reported that peer comparisons in audit and feedback reports can influence their clinical performance and how they coordinate patient care with their team members (O’Toole et al., 2011). The provision of peer comparisons encourages primary health care physicians and teams to “more aggressively address performance linked to outlying outcomes” (O’Toole et al., p. 14). The reporting of peer comparisons not only motivates primary health care physicians to change their behaviour but also serves as an incentive to engage with clinical performance reports (Agency for Healthcare Research and Quality). Typically, these comparisons are made with other practice sites, groups, or system averages (Agency for Healthcare Research and Quality). Therefore, a ‘How do Our Team Scores Compare with Participating Practices” section was added to the portrait. In this section, the practice’s overall TCI dimension score was provided in comparison with participating practices using principles of visual analytics, the What-Why-Where Framework (Munzner, 2014), Grice’s principle of cooperation, and Wright et al.’s principles of information design. Histograms were used to show the distribution of the shared perception scores for each dimension (see Appendix D) and colour saturation was used to indicate where a practice’s score fell within the distribution so that an emotional response can be evoked when practices see how they compare with other practices (Yau, 2011). A brief explanation on how to read the histograms and a legend was provided to communicate what the colour saturation indicated according to the principles of visual analytics and information design (Storme, 2014; Wright et al., 2011; Yau).
Feedback from primary health care providers in Fraser East. The revised draft of
the team climate section of the practice-based performance portrait (see Appendix D) was
presented to the primary health care providers in Fraser East. Ten family physicians attended the
TRANSFORMATION study: How local family doctors influence the science and reporting of
performance in primary health care catered dinner meeting. Two of these individuals were also
members of the Regional Stakeholder Advisory Committee and had attended the previous
meeting.

Six participants returned the feedback survey. One feedback form only had one word on
it (“yes” under the question first question); and the other five feedback forms had very general
feedback about the entire practice-based performance portrait. There was general consensus the
team climate section of the portrait was straightforward, easy to use and provided useful
information for practices. After reading the team climate section of the practice-based
performance report, one participant shared an example of how a team objective indicator score
can be used for self-reflection and in identifying areas for improvement in her practice. This also
demonstrates that the participant found the feedback to be actionable. In order for performance
measurements and reports to be useful for physicians, the performance indicators must be
perceived as clinically relevant and actionable (Agency for Healthcare Research and Quality,
2012). Overall, this demonstrates that the participant found the data presented using visual
analytics readable, understandable, and usable (Storme, 2014). However, one participant shared
that the information reported in the team climate section was too subjective to motivate the
participant to change or improve their practice. However, given the purpose and nature of the
TCI, members of the primary health care team are in the most ideal position to evaluate and
report the team climate—which is clearly a subjective matter.
In order to make the information more actionable, participants suggested that the portrait should include links to resources such as modules from the Practice Support Program provided through the General Practice Services Committee, strategies on how to improve their clinical performance based on their specific report, and information on how to implement change in practice. Unfortunately, given the scope of this project and how audit and feedback and practice portrait were defined, this was beyond the scope of the project. However, this is an area that requires further research and consideration with the growth of the practice-based performance portraits as participants expressed that this would add to their usefulness. Overall participants found the team climate section easy to use and useful for engaging in self-reflection to improve their clinical performance. Thus, no further changes were made to the team climate section of the practice-based performance portrait.

**Discussion.** The template for the team climate portion of the practice-based performance portrait was developed using the What-Why-Where framework (Munzner, 2014), Grice’s (1975) principle of cooperation (Coiera, 2003) and Wright et al.’s (1998) 6 principles of information design because no literature was found pertaining to how to report or provide audit and feedback on team climate to organizations was found. Family physicians who participated in this project agreed that the team-climate section of the practice-based performance portrait was easy to use and provided useful information that could help them facilitate change in their for the purpose of improving their clinical performance. Participants identified that the scoring scale for the Team’s Shared Perception Score and Strength on Team Climate Dimensions was easy to use to evaluate how their team climate and it was easy to read and understand that they were able to grasp the gist of the data from the bar graphs. This demonstrates the effectiveness of using Grice’s (1975; Coiera, 2003) principle of cooperation, the What-Why-Where Framework
(Munzner) and Wright et al.’s 6 principles of information design used to develop the visual analytics to report TCI results. However, more rigorous evaluations are required to determine the usefulness of each framework/principle applied in the development of the TCI section of the practice-based performance portrait.
Chapter 5: Relevance of Reporting Team Climate for Nursing

Registered nurses can play a vital role in reporting team climate to primary health care providers as Canada moves towards the integration of nurses into team-based primary health care. Primary health care providers have identified that team-based audit and feedback tools are more useful and effective when another team member (Ivers et al., 2014a), particularly nurses, are available to monitor and manage the practice performance (Hysong et al., 2014). Although nurses are the latest and most significant addition to existing primary health care teams in the shift towards team-based primary health care (Al Sayah, Szafran, Robertson, Bell, & Williams, 2014, p. 2970; The College of Physicians of Canada, 2011), nurses are well positioned to report TCI findings to primary health care providers. Nurses have the knowledge and skills, including research and statistical skills, to administer TCIs and interpret TCI scores for reporting results as per their scope of practice, professional standards, practice standards, and the Canadian Nurses’ Association’s Code of Ethics. However, nurses require further education in visual analytics, as this topic is not taught in-depth in nursing programs. Knowledge of frameworks and principles of communication, such as Grice’s (1975) principle of to compare and contrast the application of different principles and frameworks to evaluate and identify which principles and frameworks are most effective for reporting TCI results and developing performance reports in general.

Implications of Team Climate Reports for Nursing Practice

The team-climate section of the practice-based performance portrait provides an evaluation of the team climate and important insights into a team’s strengths and weaknesses that can help primary health care providers identify areas for improvement that can contribute to better organizational outcomes. An insight into factors that facilitate or impede teamwork and team performance can be useful for developing strategies for effective team functioning (Al
Sayah et al., 2014). There are various indicators outlined within nurses’ scope of practice, professional standards, practice standards, and the Canadian Nurses Association’s Code of Ethics can guide and support nurses to take initiative in cultivating, promoting, improving, and or maintaining a positive team climate within their primary health care practice setting. For example, the College of Registered Nurses of Nova Scotia (2013) requires nurses to recognize the impact of organizational culture on the delivery of health care services in order to promote safe practice environments. The section below describes how nurses can cultivate such environments and contribute to positive team climates.

**Team objectives.** Nurses can take on a leadership role to develop clear team objectives in collaboration with their primary health care team. Nurses can also demonstrate leadership, a process of influencing and inspiring members of the health care team towards common team goals or shared visions either formally or informally (College of Registered Nurses of Nova Scotia, 2012). In a qualitative study conducted by Al Sayah et al. (2014), nurses indicated that “strong organizational leadership at the clinic level, and common goals and shared vision among all team members” facilitated teamwork (Al Sayah et al., p. 2970). Strong leadership contributes to safe work environments in which primary health care teams facilitate their professional relationships and collaboration between professionals (Al Sayah et al.). Having shared goals and visions of quality patient care unifies the tasks between professionals (Al Sayah et al.).

**Participative safety.** Nurses can foster participative safety by establishing professional relationships and fostering respect for the roles, knowledge, expertise and unique contribution of each primary health care team member in the delivery of quality primary health care and improvement of patient outcomes (College of Registered Nurses of Nova Scotia, 2012; College of Registered Nurses of British Columbia, n.d.; Canadian Nurses Association, 2008; College of
Nurses of Ontario, 2002). In the study conducted by Al Sayah et al. (2014), nurses reported that relationships characterized by respect, trust, approachability, and continuous and open communication between team members played a key role in enabling teamwork.

**Task orientation.** Nurses can improve task orientation within their practice by creating an environment that supports and advocates for innovative, evidence-based health care practices for patients (College of Nurses of Ontario, 2002; Canadian Nurses’ Association, 2008). For example, nurses can begin by creating environments for critical inquiry about their knowledge, technologies, and clinical practices or behaviours to enhance their primary health care practices and patient care (College of Nurses of Ontario). Nurses can initiate this by generating or encouraging other primary health care team members to question common practices and generate research questions using the Population, Intervention, Comparison, and Outcome (PICO) format (College of Nurses Ontario; Polit & Beck, 2012). This may contribute to the improvement of primary health care delivery and promote evidence-based practice (College of Nurses of Ontario). Overall, this can help foster a safe and supportive environment for discussing and introducing quality primary health care practices (College of Nurses of Ontario).

**Support for new ideas.** Nurses can use various approaches to foster support for new ideas in their primary health care teams. Nurses can collaborate with other primary health care team members to discuss, develop, and implement evidence-based practice. Evidence-based practice refers to acting “based on successful strategies that improve client outcomes and are derived from a combination of various sources of evidence, including research, national guidelines, policies, consensus statements, expert opinion, quality improvement data and client perspectives” (College of Registered Nurses of British Columbia, 2016, p. 56). Nurses can obtain support for new ideas by sharing knowledge, facilitating discussions on and advocating
for evidence-based practice using their advocacy skills to ultimately contribute to improved patient outcomes (College of Registered Nurses of Nova Scotia, 2012; College of Registered Nurses of British Columbia). Nurses can expand and share their knowledge-base by conducting literature reviews (Polit & Beck, 2012) and sharing findings with colleagues through informal discussions with team members at the point of care, formal presentations at staff meetings, and/or by sharing relevant publications. In the context of team climate, nurses can use the TCI results as a starting point to facilitate these discussions. Overall, nurses have been prepared to engage with the interprofessional team to communicate, collaborate, and consult on ideas and strategies for delivering quality care and improving patient outcomes (College of Registered Nurses of Nova Scotia; College of Registered Nurses of British Columbia).
Chapter 6: Limitations

This SPAR project should be considered in light of a few limitations. First, feedback on the perceived ease of use and perceived usefulness of the team climate section of the practice-based portrait was only sought from physicians who participated or were considering participating in the TRANSFORMATION study while the intended audience of the practice-based performance portrait includes all health care providers and administrative staff in primary health care practices. However, all health care providers and administrative staff may not have the same graphical literacy skills as physicians and it is extremely important that all team members at the practice understand the information in the team climate section of the practice-based performance portrait in order to utilize it. Therefore, future projects and studies should consider obtaining feedback on the ease of use and perceived usefulness of the team climate section of the practice-based performance portrait from all types of health care providers and administrative staff employed at the practice. This is important because other team members, particularly registered nurses, can play a vital role in reporting, evaluating, and improving team climate in primary health practices to improve clinical performance (Hysong et al., 2014).

Second, the team climate section of the practice-based performance portrait was presented to the physicians participating in Fraser East on the same day as feedback was sought, this time constraint may have affected the amount and quality of the feedback provided. We recommend that future studies consider distributing the team climate section of the practice-based performance portrait beforehand so that physicians and other health care providers have an opportunity to thoroughly review the template and provide constructive feedback on it’s perceived ease of use and usefulness. Lastly, there were some limitations associated with the software used to develop the template. For example, it was challenging to edit the icons used to
display the different types of staff employed at the practice along with their full-time equivalent. Appendix E contains a chart comparing and contrasting potential software programs and their features that may be used to develop practice-based performance portraits in the future.
Chapter 7: Conclusion

Overall, since team-based delivery of primary health care is fairly new in Canada, it is important to measure and report team climate in primary health care practices. An evaluation of team climate can provide important insights into a team’s strengths and weaknesses and can help primary health care providers identify areas for improvement that can contribute to better organizational outcomes. Family physicians who participated in this SPAR project agreed that the team-climate section of the practice-based performance portrait was easy to use and provided useful information that could help them facilitate change in their practice for the purpose of improving their clinical performance. They also identified the need for peer comparisons and easily accessible list of actionable items and relevant resources, such as Practice Support Program modules provided through the General Practice Services Committee, as an incentive to engage them with the practice performance report. Similar findings were reported by the Agency for Healthcare Research and Quality (2012) and Ivers et al. (2014a, 2014b). Therefore, peer comparisons and actionable strategies to improve clinical behaviour should be considered and included when reporting TCI scores to primary care practices in the future.

The template for the team climate portion of the practice-based performance portrait was developed using the What-Why-Where framework (Munzner, 2014), Grice’s (1975) principle of cooperation (Coiera, 2003) and Wright et al.’s (1998) 6 principles of information. These frameworks were useful in guiding the development of the team climate section of the practice-based performance portrait and may to have some degree contributed to the ease of use and perceived usefulness of the portrait by primary health care physicians; however, more rigorous research required to evaluate the usefulness of each framework/principle. Also, although the perceived ease of use and perceived usefulness of the team climate section of the practice-based
portrait were evaluated in this project, further work is required to evaluate the actual usefulness of this data and the implications it has on practice and patient outcomes.
Appendix A: Practice-Based Performance Portrait Feedback

We would like to tailor these portraits so that the information presented within them to meet your practice’s needs to evaluate how your practice is performing. Therefore, as we move forward in the development of practice-based performance portraits, we would like to ask you for your thoughts about the portrait, including whether you found it easy to use and useful, what you liked, and any suggestions for improvement. This information will help us better tailor the portrait to your practice’s needs. Your feedback is greatly appreciated. Thank-you.

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<tbody>
<tr>
<td><strong>Do you think it is useful? Why or why not? How is it useful?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Did you find it easy to use? Why or why not?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>What did you like most?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>What could be done differently to improve the reporting of this information?</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Overall or any additional comments:

Thank-you for your feedback!
## Appendix B: TCI Subscale Indicator Scores

**Table 1**

<table>
<thead>
<tr>
<th>TCI Subscale Indicator Scores</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Team Objectives</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We are clear about our team’s objectives</td>
<td>3.7</td>
<td>1.7 – 4.8</td>
</tr>
<tr>
<td>We are in agreement with our team’s objectives</td>
<td>3.8</td>
<td>2.0 – 4.8</td>
</tr>
<tr>
<td>We think other team members agree with our team objectives</td>
<td>3.7</td>
<td>2.1 – 4.4</td>
</tr>
<tr>
<td>We think our team members are committed to our team objectives</td>
<td>3.7</td>
<td>1.9 – 4.6</td>
</tr>
<tr>
<td><strong>Participative Safety</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We have a “we are in it together” attitude</td>
<td>4.1</td>
<td>2.5 – 5.0</td>
</tr>
<tr>
<td>People keep each other informed about work-related issues in the team</td>
<td>3.9</td>
<td>2.5 – 4.8</td>
</tr>
<tr>
<td>People feel understood and accepted by each other</td>
<td>4.0</td>
<td>2.4 – 4.8</td>
</tr>
<tr>
<td>There are real attempts to share information throughout our team</td>
<td>4.1</td>
<td>2.5 – 4.8</td>
</tr>
<tr>
<td>There is a lot of give and take</td>
<td>4.0</td>
<td>2.9 – 4.7</td>
</tr>
<tr>
<td>We keep in touch with each other as a team</td>
<td>4.0</td>
<td>2.5 – 4.8</td>
</tr>
<tr>
<td><strong>Task Orientation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colleagues provide useful ideas and practical help to enable me to do the job to the best of my ability</td>
<td>4.0</td>
<td>2.7 – 4.8</td>
</tr>
<tr>
<td>Team members are prepared to question the basis of what the team is doing</td>
<td>3.7</td>
<td>2.5 – 4.5</td>
</tr>
<tr>
<td>Our team critically appraises potential weaknesses in what it is doing in order to achieve the best possible outcome</td>
<td>3.4</td>
<td>2.0 – 4.2</td>
</tr>
<tr>
<td>Team members build on each other’s ideas in order to achieve the best possible outcomes</td>
<td>3.7</td>
<td>2.0 – 4.4</td>
</tr>
<tr>
<td><strong>Support for New Ideas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team members provide practical support for new ideas and their application</td>
<td>3.8</td>
<td>2.9 – 4.5</td>
</tr>
<tr>
<td>Members of our team provide and share resources to help in the application of new ideas</td>
<td>3.8</td>
<td>2.5 – 4.3</td>
</tr>
<tr>
<td>Our team members are always searching for fresh, new ways of looking at problems</td>
<td>3.7</td>
<td>2.5 – 4.3</td>
</tr>
<tr>
<td>Our team is open and responsive to change</td>
<td>3.9</td>
<td>2.5 – 4.5</td>
</tr>
<tr>
<td>Our team is always moving toward the development of new answers</td>
<td>3.9</td>
<td>2.6 – 4.4</td>
</tr>
</tbody>
</table>

Note. \( n = 10 \) family practices.
Appendix C: Initial Iteration of the Team Climate Section of Practice-Based Performance Template

Initial Template Draft

Practice-Based Performance Portrait
A Snapshot of Your Practice

April 2016

Initial Template Draft

About this Portrait

This portrait provides an overview of information about your clinic. The information presented in this document was collected using an organizational survey and team climate survey as a part of the TRANSFORMATION study. In 2013, the organizational survey was completed by a staff member at your clinic and the team climate survey was completed by various members of your team. The information in this portrait is a snapshot of what you told us about your clinic about the following: your clinic’s team climate, the organization of your clinic, organization vision and values, organizational resources, organizational structures, service provision and clinical practices, and organizational context. This portrait attempts to provide you with a ‘baseline snapshot’ of your practice and requires your interpretation with the practice and clinical context in mind. Your clinic may find this portrait to be a useful tool in identifying areas for improvement and facilitating change.

To find out more information about our study please visit our website: www.transformationphc.ca/
Executive Summary: What You Told Us About Your Clinic

TEAM CLIMATE

Your team has a <insert strength from scale> shared perception on team objectives, participative safety, team orientation, and support for new ideas.

Scores:
- Team Objectives: X.X
- Participative Safety: X.X
- Team Orientation: X.X
- Support for New Ideas: X.X

ORGANIZATIONAL RESOURCES

Existing resources: Accessible after hours and performance reviews

Future opportunities could include: Review data on clinical outcomes and hospitalizations

ECONOMIC RESOURCES

Existing resources: Diverse funding sources

COORDINATION AND WORKFLOW

Existing services: Coordinated transitional care & specialist phone consults

Future opportunities could include: Shared care or case discussions

CLINICAL PRACTICE AND INNOVATION

Existing services: Comprehensive services and EMR use

Future opportunities could include: Prompts for overdue labs or a strategy for improving teamwork
Team Profile

Your Team
Your team consists of X members. Your team is comprised of doctors, registered nurses, pharmacists, and administrative staff.

- General Practitioners
- Pharmacists
- Registered Nurse
- Administrative Staff

Your team shares the clinic’s mission, values, and objectives. Your clinic believes that health is mostly a collective responsibility, in which society is responsible for creating conditions that help maintain or improve health. Your organization believes that everyone should have the same access to healthcare based on need, regardless of their ability to pay.
Team Climate

Team climate refers to a “team’s shared perceptions of organizational policies, practices, and procedures” (1). Measuring team climate can provide important insights into a team’s strengths and weaknesses and help identify areas for improvement that can contribute to better organizational outcomes. Positive team climates can contribute to job satisfaction, better self-reported team effectiveness, better patient satisfaction with care, and innovation (2,3). It is characterized by four dimensions: team objectives, participative safety, task orientation, and support for new ideas. Each dimension is described in the next section.

The Team Climate Index (TCI), consists of 19 statements and is a valid and reliable tool. It was used to understand team climate in your organization (1). Team members rate their degree of agreement on each statement. The response rate for the team climate survey at your practice was 69%.

Subscale scores and overall dimension scores were calculated out of 5. The scoring for each subscale and its items ranges from 1 (none or very weak) to 5 (very strong). The higher the score, the greater the team’s shared perception.

Your team’s overall score for each dimension of team climate are:

- **Team Objectives**: X.X
- **Participative Safety**: X.X
- **Task Orientation**: X.X
- **Support for New Ideas**: X.X

*Note: In the following sections, the term “we” in this report is used to collectively refer to the team members who responded to the team climate survey. Questions of participative safety and support for new ideas were measured using 5-point Likert scales (1 = strongly disagree to 5 = strongly agree). Questions of team objectives and task orientation were measured using 7-point Likert scales (1 = not at all to a very little extent to 7 = completely agree to a very great extent).
Task Orientation refers to a team's commitment to improve the quality of task performance in relation to the team objectives. Your score is X.X, your team has a high perception on task orientation.

Support for New Ideas is the expectation, approach, and practical support of attempts to introduce new and improved ways of doing things in the work environment. Your score is X.X, your team has a high perception on support for new ideas.

References


Appendix D: Final Iteration of the Team Climate Section of Practice-Based Performance Template

Practice-Based Performance Portrait - Preliminary
A Snapshot of Your Practice

April 2016

About this Portrait
This portrait provides an overview of information about your practice. The information presented in this document was collected using an organizational and provider survey as a part of the TRANSFORMATION study. In 2015, the organizational survey was completed by a staff member or physician lead at your practice, the physician completed a provider survey and staff members completed a team climate inventory survey. The information in this portrait is a snapshot of what was reported. This portrait is organized using the ten goals of the Patient’s Medical Home: (1) patient-centered care; (2) personal family physician; (3) team-based care; (4) timely access; (5) comprehensive care; (6) continuity of care; (7) electronic medical record; (8) education, training, and research; (9) evaluation and quality improvement; and (10) internal and external support. This portrait is preliminary and attempts to provide you with a ‘baseline’ of your practice and requires your interpretation with the practice and clinical context in mind. Your clinic may find this portrait to be a useful tool in identifying areas for improvement and facilitating change in moving towards becoming a Patient’s Medical Home.

To find out more information about our study please visit our website: www.transformationphc.ca/
Executive Summary

The Patient’s Medical Home (PMH) is the Canadian College of Family Physicians vision for what the future family practice in Canada will be. (1) The information provided in this portrait shows your results compared to other participating practices in Fraser East and to all other practices in similar sites: Eastern Ontario, ON and Central Zone, NS. In order to become a PMH, family practices must strive to meet the following ten goals:

1. Patient-Centered Care
2. Personal Family Physician
3. Team-Based Care
4. Timely Access
5. Comprehensive Care
6. Continuity of Care
7. Electronic Medical Records
8. Education, Training, & Research
9. Evaluation & Quality Improvement
10. Internal & External Supports

3. Team Based Care

Team Based Care means that all members of the PMH work together to improve care for patients.

Your Team consists of X members. Your team is comprised of doctors, registered nurses, pharmacists, and administrative staff.
**Template**

**Team Climate** refers to a "team's shared perceptions of organizational policies, practices, and procedures" (2). Measuring team climate can provide important insights into a team's strengths and weaknesses and help identify areas for improvement that can contribute to better organizational outcomes. Positive team climates can contribute to job satisfaction, better self-reported team effectiveness, better patient satisfaction with care, and innovation (3,4). It is characterized by four dimensions: team objectives, participative safety, task orientation, and support for new ideas. Each dimension is described in the next section.

The Team Climate Index (TCI), consists of 15 statements and is a valid and reliable tool. It was used to understand team climate in your organization (2). Team members rate their degree of agreement on each statement. The response rate for the team climate survey at your practice was 69%.

The scoring for each dimension and its items ranges from 1 (none or very weak) to 5 (very strong). The higher the score, the greater the team's shared perception.

**Team's Shared Perception Score and Strength on Team Climate Dimensions and Items**

1. None/Very Weak
2. Weak
3. Neutral
4. Strong
5. Very Strong

Your team’s overall score for each dimension of team climate are:

- **X.X** Team Objectives
- **X.X** Participative Safety
- **X.X** Task Orientation
- **X.X** Support for New Ideas

*Note: In the following sections, the term "we" in this report is used to collectively refer to the team members who responded to the team climate survey.

---

**Template**

**Team Objectives** provide direction and value to the team’s work (5). Your score is X.X, your team has a <Insert strength according to scale> shared perception on team objectives.

**Shared Perception Scores on Team Objective Items**

- We think our team members are committed to our team objectives
- We think other team members agree with our team objectives
- We are in agreement with our team’s objectives
- We are clear about our team’s objectives

**Participative Safety** refers to how safe, comfortable and motivated team members feel participating or engaging in decision-making, sharing new ideas, and interacting with colleagues (2). Your score is X.X, your team has a <Insert strength according to scale> shared perception of participative safety.

**Shared Perception Scores on Participative Safety Items**

- We keep in touch with each other as a team
- There is a lot of give and take
- There are real attempts to share information throughout our team
- People feel understood and accepted by each other
- People keep each other informed about work-related issues in the team
- We have a "we are in it together" attitude
Task Orientation refers to a team’s commitment to improve the quality of task performance in relation to the team objectives (2). Your score is X.X, your team has a <<insert strength according to scale>> shared perception on task orientation.

Support for New Ideas is “the expectation, approach and practical support of attempts to introduce new and improved ways of doing things in the work environment” (2). Your score is X.X, your team has a <<insert strength according to scale>> shared perception on support for new ideas.

How do our team climate scores compare with participating practices?

For each team climate dimension, a histogram is used to display the distribution of the overall dimension score from participating clinics for which reliable data were available (N=42). The darker shaded area indicates where your overall team climate dimension score falls within the distribution.
References


## Appendix E: Compare and Contrast of Different Software for Creating Practice-Based Portfolios in the Future

<table>
<thead>
<tr>
<th>Software</th>
<th>Features</th>
<th>Desired Features (so far)</th>
</tr>
</thead>
</table>
| Apple Pages     | • Allows you to make 2D, 3D, and interactive graphs and charts within the document (have to put data into the data editor within the document)  
• Allows you to keep comments within the document  
• Has some pre-existing templates or can create your own  
• Use pre-made shapes or make your own  
• Allows you to export document into a PDF or word file  
• Can secure file with password | • Can convert template/document into a PDF file  
• Click on table of contents to see specific content (not sure what this is called or referred to in software)  
• Creates bold charts, graphs, and tables  
• Creates professional document |
| Microsoft Visio | • Creates data-driven visuals  
• Professional looking documents can be created  
• Easy to link diagram to data sources (Eg. Excel)  
  o Diagram will immediately and automatically be refreshed to reflect data changes  
• Vibrant visuals  
• Large gallery of themes/templates  
• Diagram validation to assess diagrams for accuracy and consistency  
• SharePoint Server – communicate and manage ideas and thoughts  
• Creates actionable visual mash-ups?  
• Use pre-made shapes or make your own  
• Unsure whether this program would allow us to export the document into a PDF file. |                                                                                                                                                           |
| Omnigraffle     | • Creative stencils and templates can be developed  
• Allows you to easily bring things to the foreground or background  
• Has very few pre-existing templates  
• Can use pre-existing shapes or develop your own  
• Can export to different file formats, including PDF.  
• Useful for creating flowcharts |                                                                                                                                                           |

*Italicized – Features I may need.*
References


https://www.myhealthmycommunity.org/Results/CommunityProfiles.aspx

https://www.myhealthmycommunity.org/Results/RegionalReports.aspx


