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Willis, Cameron David; Saul, Jessie; Bevan, Helen; Scheirer, Mary Ann; Best, Allan; Greenhalgh, Trisha; Mannion, Russell; Cornelissen, Evelyn; Howland, David; Jenkins, Emily; Bitz, Jennifer

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Cameron David Willis Jessie Saul Helen Bevan Mary Ann Scheirer Allan Best Trisha Greenhalgh Russell Mannion Evelyn Cornelissen David Howland Emily Jenkins Jennifer Bitz

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Sustaining organizational culture change in health systems

1. INTRODUCTION

This article describes a policy-focused literature review informed by concepts from rapid realist review methodology, and focused on understanding the factors associated with implementing and sustaining cultural change in health care organizations. Organizational culture change is recognized as a key element in large system transformation (LST)(Lukas et al., 2007), which is in turn assumed to be an explicit approach to health care system reform "with the goal of significant improvements in the efficiency of health care delivery, the quality of patient care, and population-level patient outcomes" (Best et al., 2012). LST involves changes to multiple components of health care systems, including primary care practices, hospitals, professional practice, as well as the financial, regulatory and policy systems underpinning these agencies and their inter-relationships. Such LST is currently underway in the Canadian province of Saskatchewan, where leaders in the Ministry of Health (the Ministry) have expressed a need to better understand how changes in the cultures of their health care organizations (that are in part being shaped through the implementation of Lean methodologies) may be sustained over time. This review distils, integrates and synthesizes a diverse evidence base to address this question.

Saskatchewan operates a tax-based universal health system administered by provincial, regional and local health care organizations. Health services are largely provided through Saskatchewan's regional health authorities, affiliated organizations, and the

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Saskatchewan Cancer Agency. Leaders in Saskatchewan are making an explicit and coordinated effort to transform the provincial health system to one that is centered on the needs of patients and their families, that provides cohesive rather than fragmented services, and that empowers frontline providers to improve their own services (Dagnone, 2009). A key component of this ambitious transformation agenda is the deployment of a province-wide Lean Management system (detailed discussions of Lean are provided elsewhere (Jones and Mitchel, 2006, Young et al., 2004, Vest and Gamm, 2009)), designed to improve the value of processes of care through the identification and reduction of waste and unwarranted variation (e.g. delays in access, duplicate interventions) and harm to patients (e.g. omissions, medical errors) (Young et al., 2004, Friedman et al., 2007, Holden, 2011)). As noted in Figure 1, major factors associated with Lean management in Saskatchewan have included high level political support, a staged process to Lean introduction, and the engagement of external consultants to ensure a rigorous and disciplined approach to Lean management throughout the province (note: the context for this review relates to the change in culture that is occurring in Saskatchewan through explicit LST efforts, of which Lean implementation is one. Findings from this review may therefore have relevance to other LST efforts that have impacts on culture, using differing methodological approaches).

A number of recent reviews of Lean in health settings highlight the challenges in assembling and learning from this evidence base (DelliFraine et al., 2010, Glasgow et al., 2010, Mazzocato et al., 2010, Poksinska, 2010, Holden, 2011, Vest and Gamm, 2009). Among these challenges are limited rigorous evaluations of Lean projects, difficulties in

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linking Lean to outcomes, and an incomplete understanding of Lean sustainability over time (Glasgow et al., 2010, DelliFraine et al., 2010, Poksinska, 2010). Despite an operational focus on specific process improvements, the overall aim of a systematic Lean investment – including that being implemented in Saskatchewan - is to create and sustain a *culture* of continuous quality improvement that supports advances in access, quality, safety, efficiency and value at all levels of the health care system (Spear, 2005, Glasgow et al., 2010). Yet the impact of Lean on enduring changes in organizational culture is rarely examined in depth (Vest and Gamm, 2009).

Although the terms are commonly used, there are no universally accepted definitions of culture, organizational culture or sustained cultural change. Different theoretical traditions based on different ontological and epistemological assumptions exist, which frame whether culture is viewed as something that can be shaped and manipulated by purposeful design, or whether it is something difficult or impossible to influence and manage to beneficial effect (Schein, 2010, Smircich, 1983). Edgar Schein interprets culture as a multi-layered concept comprising of three layers: i) artefacts, which consist of tangible, observable actions, documents, and items; ii) beliefs, values, norms, and rules of behaviour that help define the artefacts that can be observed; iii) and at the deepest level the basic assumptions (often unconscious) that influence and guide behaviour, perceptions and thoughts (Schein, 2010). As recently noted "at the heart of many definitions, is that culture consists of the values, beliefs, and assumptions shared by occupational groups" (Davies and Mannion, 2013). These groups, or subcultures, have powerful effects on individuals and organizations, and need to be recognized and worked

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with during any cultural change.

Given the multi-layered nature of organizational culture, sustained culture change acquires “different meanings in different contexts, and at different times” (Buchanan and Fitzgerald, 2005, p 190). As culture is dynamic, cultural sustainability may perhaps only be understood as an ongoing process of continual renewal and change. Further, it may be argued that cultural change has to be both widespread and enduring in order to deliver positive results. In this study, we define sustained cultural change as the long-term and deeply embedded changes in the values, beliefs and assumptions of people with shared organizational membership. We go beyond analysis of the maintenance of a specific change process or intervention *within* a healthcare system, to examine changes *of* the health care system and its cultures, that is, interventions intended to stimulate more fundamental changes in the ways the system components and actors interrelate.

1.1 Research Questions

Given the ambitious and large-scale transformation agenda being pursued in Saskatchewan, and the interest of the Ministry in understanding the principles by which cultural changes may be sustained in organizations, this review addressed the following research questions:

1. What are the guiding principles by which organizational culture change may be sustained in healthcare organizations;
2. What are the mechanisms by which these principles may operate; and,

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3. What are the contextual factors that influence the likelihood of these principles being effective?

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2. MATERIALS AND METHODS

Given this study's focus on mechanisms and contexts for sustaining culture change, a knowledge synthesis informed by a realist approach was considered the most appropriate review method ((Pawson, 2013) We were aware of the RAMESES publication standards for full realist reviews which were under development while this review was being undertaken (Wong et al., 2013), and we broadly followed these recommendations. However, a number of modifications were made to tailor the process for our purposes, which are described below.

Traditional realist synthesis aims to provide an understanding of "what works, for whom, in what contexts, to what extent, and most importantly how and why?" (a detailed discussion of realist methodology, including how it differs from other approaches to evidence synthesis, is provided elsewhere (Pawson, 2013). In consultation with leaders from Saskatchewan, we postulated that a knowledge synthesis that highlighted possible guiding principles by which cultural change may be sustained would be of most value to the Ministry. As a result, the emphasis of the review subtly changed from one that was focused on generating theory (the focus of traditional realist reviews) to one that focused on identifying action oriented principles related to sustaining cultural change, complemented with an understanding of the contexts (C) and mechanisms (M) by which such principles might operate. For this review, mechanisms are considered the processes used to stimulate and/or implement the intended change or interventions, while contexts are the characteristics of both the subjects and the program/activity locality (Pawson, 2002, Pawson, 2013). While we attempted to distinguish between contexts and

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mechanisms (as per RAMESES guidelines), confusion continues to exist over the precise definition of these terms, which may be particularly problematic in examinations of culture change and cultural sustainability (see Results) (Astbury and Leeuw, 2010). Moreover, while we recognize that contexts may include factors related to the external environment (e.g. revenue streams, regulatory context, the natural environment, and the views, assumptions and histories of patients) this review was primarily concerned with the internal culture of systems and organizations, and therefore focused on factors related to internal contexts.

Our review was informed by a modified rapid realist review process, which has been described extensively elsewhere (Saul et al., 2013). Briefly, this modified process follows five highly iterative stages:

1. Developing and refining research questions;
2. Searching and retrieving information;
3. Screening and appraising information;
4. Synthesizing information; and
5. Interpreting information.

As per this methodology, and in line with the RAMESES recommendations (Wong et al., 2013), we engaged two panels: (1) a local reference panel to ensure the review was grounded in the needs of the knowledge user, and (2) an international expert panel to ensure the review was consistent with international experience and current professional knowledge of cultural change and sustainability. Reference panel members included

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members of the Ministry's Strategy and Innovation Branch, the Provincial Kaizan Promotion Office, Regional Healthy Authorities and the Health Quality Council. Expert panel members were selected based on a combination of expertise and experience, and represented fields such as organizational change, patient safety, system transformation, organizational culture change and sustainability in health systems. Expert panelists were from Canada, the USA, UK, Sweden and Australia. The research questions guiding this review evolved over time with input from both the expert and reference panels. A preliminary Medline search was conducted using key terms contained in documents proposed by the expert and reference panels (which included published and grey literature). From this preliminary search, 11 articles were deemed relevant and informed the development of a thorough Medline search which was executed on the 2nd of November 2011. The search strategy was adapted to explore five additional databases (which include a combination of grey and published literature): Embase, Social Services Abstracts, Social Work Abstracts, ERIC and Sociological Abstracts (the full search proceeded over approximately two months).

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Two reviewers (CW and JB) screened titles and abstracts of articles identified from the thorough search using inclusion and exclusion criteria collaboratively developed by the research team, reference panel and expert panel. As the screening process unfolded, a number of inclusion and exclusion criteria were added and/or modified leading to the final list of criteria as outlined in Table 1. Three research team members (JS, EC and EJ) conducted extractions of the final set of selected articles using extraction templates (available on request). The research team undertook a calibration exercise to ensure

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extractions were completed in a standardized manner regarding the level of detail and relevant themes. Extractions for the remaining articles were conducted by one of three reviewers (EC, EJ and JS).

Using completed extractions, the synthesis lead (JS) identified a wide range of interventions associated with sustaining cultural change (the 'outcome' in this review and considered to be the cumulative changes occurring to multiple cultural layers), identified relevant contextual factors that influence (and are influenced by) these interventions, and formed an evolving understanding of the mechanisms by which cultural change is sustained. These intervention-context-mechanism-outcome (I-C-M-O) configurations were examined by a secondary reviewer (CW) and verified against completed extractions. Verified I-C-M-O configurations were circulated to the research team, reference panel and expert panel and grouped according to common principles of action. Based on feedback from the panellists, further synthesis continued until final guiding principles were refined, with supportive theoretical I-C-M configurations. This process therefore identified a number of guiding principles with a range of supportive interventions, which may have different intended audiences, effects and methodological approaches. While we recognize this diversity, it is not our intent to organize these interventions according to their methodological traditions; rather we intend to present these interventions as they relate to sustaining cultural change (and the contexts and mechanisms by which they operate). It is therefore possible that interventions, contexts and mechanisms will appear across different guiding principles, illustrating how particular interventions may influence cultural change in multiple ways. Data synthesized

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in this review, including the identified guiding principles, is now forming an important input into provincial planning activities, such as the 2014-2015 Saskatchewan Health System Strategic Plan(Government of Saskatchewan, 2014).

A number of changes were made during the process of undertaking the review (Wong et al., 2013). For example, expert panel members identified the need to consider the role of organizational subcultures in any discussion of cultural change, thereby broadening the analytical scope. Moreover, because of the paucity of literature relating directly to sustaining cultural change, and because of the perceived close connection between implementation of culture change and its sustainability, articles that outlined the processes of implementing change were also deemed relevant, and were therefore included.

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3. RESULTS

The results of the literature search are described in Figure 2. Based on panel recommendations, citation searches and an extensive database search, 865 potentially relevant documents were identified. Of these, 68 met inclusion criteria and were included in the final review. Documents were a combination of primary and secondary data analyses. Many did not state the time period over which the cultural change in question was examined. Of those documents that did, this period varied widely: many focused on changes occurring between 1 to 4 years (Edwards et al., 2007, Sheaff et al., 2010, Lukas et al., 2007, Chreim et al., 2010, Connolly and Smith, 2010, Baker et al., 2003, Drenkard, 2001, Kingsley, 2001, Masso et al., 2010, Detert and Pollock, 2008, Parsons and Cornett, 2011, Pellegrin and Currey, 2011), 5-10 years (Coustasse et al., 2007, Dressendorfer et al., 2005, Buchanan and Fitzgerald, 2007, Buchanan and Fitzgerald, 2005, Berger, 2004, Yano et al., 2007, Vest and Gamm, 2009, Greenhalgh et al., 2012), or in some instances more than 10 years (Macfarlane et al., 2011, Amis et al., 2002).

The following section describes six guiding principles found to be associated with sustaining organizational culture change: (1) align vision and action; (2) make incremental changes within a comprehensive transformation strategy; (3) foster distributed leadership; (4) promote staff engagement; (5) create collaborative interpersonal relationships; and (6) assess cultural change. Table 2 describes how each document contributed to the identified guiding principles (note, documents were able to contribute to multiple principles). We propose that these guiding principles are important for sustaining cultural change as related to Lean implementation, as well as other

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transformative efforts. The following text provides examples of several contexts and mechanisms listed in Table 2; space precludes providing full details for each sub-bullet in Table 2. Those factors not discussed in detail in this article include the processes by which managers may relinquish traditional notions of control, how the value of performance data may be increased in organizations, and how the readiness of organizations for large-scale change may be assessed or facilitated (further details are available from the authors upon request).

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3.1 Align vision and action

Alignment refers to the connection between transformational vision and action through a range of activities performed by those at multiple levels of a system (including shaping health policy that sets vision, that ensures vision is adequately supported through strategic targets, resource allocation plans, and performance monitoring strategies, and that helps to coordinate relevant organizational subcultures) (Lukas et al., 2007, Bevan, 2012, Edwards et al., 2007, Schein, 2010). Alignment-focused interventions are many and varied, and include those that improve the "consistency of plans, processes, information, resource decisions, actions, results and analysis" (Lukas et al., 2007), and require leaders to explicitly plan for impacts on front line staff and clinical care. Such interventions might include specific policy efforts to create structural or procedural change (including resource allocation plans, outlining expected clinical and non-clinical roles and responsibilities, and developing performance monitoring and reporting strategies), or, application of sustainability frameworks such as developed by Edwards et al. in their examination of Partnerships for Quality projects in the USA (Edwards et al.,

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2007). Such frameworks may be useful for policy makers attempting to link the *goals* of sustainability with the supporting *elements* of sustainability (described in terms of financial/non-financial incentives, use of incremental opportunities, staff training and support, information systems etc.) (Edwards et al., 2007, Lukas et al., 2007, Berger, 2004). For coordinating organizational subcultures, lessons from Harvard's Learning Innovations Laboratory highlight the role of social and structural bridges, that provide vehicles for telling stories, building on existing relationships and working with mid-level groups (as well as top-down/bottom-up directives) to coordinate an enduring connection between vision and action across system levels (Wilson, 2010). Noteworthy, policy changes to better align vision with resource use may require investment in tasks related to budget decisions, skill building, and time allocations for team meetings, planning or piloting: all of which may necessitate time away from direct patient care.

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3.1.1 Contextual factors

Interventions to align vision and action may be particularly important for helping policy makers bring cohesion to multiple Lean projects, which often fail to progress beyond individual ward, department or organizational level activities (Radnor et al., 2012). As noted in Table 2, such interventions interact with a range of contextual factors operating within organizations, including: current standard operating procedures; the interests and incentives previously supported; as well as the pre-existing values and beliefs of organizational members operating in different subcultures, particularly when alignment requires a compromise in those values or beliefs. The reorganization of the Canadian Olympic National Sport Organizations (NSOs) provides one such example, where an

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external agent (Sport Canada) attempted to modify the external contexts of member organizations by imposing a set of values on the operations of NSOs (Amis et al., 2002). The degree to which changes were sustained depended in part on how closely aligned the values of each NSO were to the values being imposed. Where values conflicted (e.g., a value of volunteer support vs. one of professional control), resistance to change emerged. The authors concluded that "while coercive pressures may be effective at initiating change, for the alterations to be any more than ephemeral they must coincide with the values held by organization members" (Amis et al., 2002).

3.1.2 Mechanisms

Interventions that help to align vision with action in ways that are sensitive to existing contextual values and beliefs help sustain cultural change by activating a range of mechanisms. These mechanisms include, prompting new actions from those in redefined roles, promoting use of a common program language and fostering a sense of legitimacy, cultural humility, willingness to engage and mutual respect (Table 2). For example, policies may budget for integration teams that have the "formal authority to decree change, ability to allocate resources, expertise needed to channel the processes and content of change", which are reported to assist in aligning diverse goals and procedures in part through their capacity to build relationships and inspire trust (Chreim et al., 2010, Schein, 2010). As noted by Berger et al., integration teams achieve impact through use of a common program language and incentivized performance targets (Berger, 2004), which in the case of Lean, may help create and maintain a shared definition and focus on the 'customer' (Radnor et al., 2012). These new team structures are empowered by the

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inter-professional bridges they create, which serve to link clinicians, project coordinators, health authority managers, policy makers, program/service groups and other care providers (Chreim et al., 2010). These inter-professional teams may assist in activating a sense of legitimacy and cultural humility among organizational leaders, generating a willingness to engage across organizational subcultures in a spirit of mutual respect and coordinated action (Schein, 2010).

3.2 *Make incremental changes within a broader transformation strategy*

Incremental changes relate to small-scale changes that are gradually rolled out in ways that build on each other and become institutionalized as change as unfolds. As described by Buchanan et al., "attempts to implement and spread changes too rapidly can damage the impact and sustainability of those improvements" (Buchanan and Fitzgerald, 2007). As a result, "small scale incremental changes are important in their own right, and can accumulate to generate more significant forms of service improvement" (Buchanan and Fitzgerald, 2007). This concept was highlighted by Day's analysis of the cultural changes associated with introduction of a national EMR, which demonstrated how multiple small changes (e.g. activities associated with discrete projects related to implementing IT infrastructure) may build incrementally, leading to enhanced sustainability of those changes (Day and Norris, 2007). Cultural transformation may therefore be seen as a cumulative experience explored through small scale experimental activities, which are institutionalized as the change process unfolds (Day and Norris, 2007).

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The concepts described by Buchanan and Day share similarities with the perspectives of Alinksy, who suggests that "a new idea must be at the least couched in the language of past ideas; often, it must be, at first, diluted with vestiges of the past" (Alinsky, 1971). For sustaining cultural change, this may require health policy that sets a broader transformative vision, and then promotes specific actions that build positively, gradually, and iteratively on past experiences. Similarly, in their review of literature on organizational change, Austin and Claassen suggest that successful change is characterized by simplicity, a degree of affinity to previous practices, and a gradual roll out in stages or small steps (Austin and Claassen, 2008). Policies that allow sufficient time and resources for gradual introduction of change provide opportunities for broad participation and experimentation, increasing the likelihood that change will be sustained (Edwards et al., 2007). Yet very small-scale changes that fail to challenge existing paradigms in and of themselves are unlikely to lead to sustained shifts in organizational cultures. The ultimate sustainability of any transformation lies in the ongoing recognition by key stakeholders of the benefits of change, rather than simply short-term, disconnected successes (Day and Norris, 2007).

3.2.1 Contextual factors

Introducing change through a gradual process may appeal to an organization's sense of experimentation, or help motivate an organization's sense of experimentation (Table 2). In either case, it requires an ability to maintain focus on a sustained process of change, while individual practices or approaches to change may fluctuate. In health care contexts adopting a Lean approach, many pockets of Lean projects may exist, rather than an

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organization or systems-wide effort (Radnor et al., 2012). Moreover, such pockets may (or may not) be associated with specific subcultures that are loosely associated with each other, or with the broader organizational culture itself (Bloor, 1999). As noted, these pockets of activity and subcultures may be sensible starting points, as change made gradually and tailored to the needs and views of specific subcultures may assist in fostering organizational experimentation to assess potential human, financial or technical repercussions (Day and Norris, 2007). Experimentally oriented organizations with robust measurement and reporting policies, may be better positioned to learn from and adapt to gradually introduced change. Such a reporting policy can highlight the continually evolving nature of organizational change, where the *process* of change or quality improvement might be constant, but the specific *practices* might be ever-evolving (Buchanan and Fitzgerald, 2007). The challenge for many investing in Lean methodologies is in taking often stand-alone initiatives to a "broader system-wide improvement philosophy" (Radnor et al., 2012).

3.2.2 Mechanisms

Incremental changes introduced in contexts supportive of experimentation, measurement and learning help sustain cultural change through a number of mechanisms. In these settings, incremental changes help to draw in a variety of participants from various subcultures, leading to greater staff engagement, and an improved sense of shared ownership (Edwards et al., 2007), which may in turn reduce fear, increase acceptance and promote willingness to contribute to the overall change process (Table 2). Edwards et al.

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suggest that to generate sustainable change, allowing all possible partners to contribute to the change process through differing levels of involvement is key (Edwards et al., 2007).

Investing in incremental change also ensures that the range of activities needed to generate system wide cultural transformation reflect the capacity of the organizations and systems in which they are implemented (Day and Norris, 2007). This helps highlight "small-wins", as noted by Austin and Claassen in their analysis of evidence-based practice in private, public and non-profit settings, which may assist participants to recognize success, activating a greater awareness of their own skills and capabilities (Austin and Claassen, 2008). In applying Lean methodologies, people's skills and capabilities in specific process improvement *tools* may therefore need to be fostered and recognized in a way that encourages experimentation, perhaps before the focus can shift from *projects* to *process* (Radnor et al., 2012, Vest and Gamm, 2009). Policy approaches that gradually build skills through smaller-scale Lean initiatives might therefore allow staff to adapt to small changes, build individual and team confidence, and thereby minimize resistance to transformative efforts (Day and Norris, 2007).

3.3 Foster distributed leadership

For implementing and sustaining cultural change, high level leadership support is critical. Lukas et al. note the power of genuine and passionate leadership in maintaining urgency, setting consistent directions, reinforcing expectations and providing resources (Lukas et al., 2007). While senior leadership is important, leadership that facilitates cultural change needs to involve more than the CEO, as noted by existing literature related to large

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system transformation that identifies the value of activities that promote top-down and bottom-up leadership (Best et al., 2012, Burston et al., 2011, Wilson, 2010, Lukas et al., 2007). This requires interventions that create designated (e.g. specific people 'in charge' of an activity) and distributed (e.g. where responsibility is shared) leadership roles (Best et al., 2012). While other styles of leadership (e.g. transactional and transformational leadership) impact cultural change, distributed leadership was a central element of many included studies (see Table 2) and is thought to re-focus attention from the heroic activities of single leaders, to the enduring practices and relationships of "coalitions of agents with complementary skills and resources"(Chreim et al., 2010) (Best et al., 2012).

Investigations of leadership models have highlighted the varying leadership activities of policy makers in governments, project coordinators, clinical teams and regional health authorities (Chreim et al., 2010). These diverse groups have different foci, power and spheres of influence, with roots in numerous organizational subcultures. Yet as no single agent has the power, authority, resources or expertise to lead all change activities, Chreim et al. and others describe the emergence of shared leadership models, which include representation from a range of groups with different resources, influences, mandates and talents (Chreim et al., 2010, Buchanan and Fitzgerald, 2007). These types of leadership models help reduce organizational fragmentation, such as disconnections between 'tops' of organizations – including Lean champions - and those applying specific tools in clinical practice (Radnor et al., 2012, Vest and Gamm, 2009). Moreover, by adopting a distributed view of leadership for sustaining cultural change, the leadership skills of those from different subcultures, who may not actively identify as leaders can be recognized

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and supported, resulting in the emergence of coordinated and complementary leadership streams, both vertically and horizontally (Chreim et al., 2010, Gronn, 2002).

3.3.1 Contextual factors

Interventions to develop distributed leadership will have most impact when implemented in contexts that support staff engagement in leadership activities (Table 2). In turn, policies that foster distributed leadership efforts help create environments where staff can proactively manage the change process and where staff are reassured that participation will not result in the enforcement of penalties (Best et al., 2012). Distributed leadership may also modify reward and incentive structures that support organizational members in assuming leadership roles (Berger, 2004). Similar to other initiatives, such as 'matrix management', efforts to distribute leadership may have little effect when implemented in settings with non-supportive bureaucracies and regulations, staff confusion and time conflicts, and manager resentment over loss of power (Burns and Wholey, 1993). Distributed leadership therefore needs to include consideration of existing formal leaders, as well developing informal leaders, including "opinion leaders" as emphasized by Rogers' influential diffusion of innovations framework (Rogers, 1995). Within diverse organizational subcultures, not everyone desires or needs to lead: a preferential goal may be the identification and activation of leaders with the skills and motivation to influence members of particular subcultural groups (Grant, 2011).

3.3.2 Mechanisms

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Distributed leadership models that are enabled by policies that allocate time and resources to staff engagement in leadership activities, create a shared sense of energy between organizational members (Chreim et al., 2010, Harrison and Kimani, 2009), activating "a learner's sense of psychological safety" (Schein, 2010). This sense of safety is further supported by the broad involvement of teams in small-scale projects that helps demonstrate that change is possible, leading to greater likelihood of scale-up, spread and sustainability (Brown and Duthe, 2009, Harrison and Kimani, 2009, Lukas et al., 2007, McGrath et al., 2008). Distributed leadership models in contexts that operate (at least in part) through small-scale project teams within or across organizational subcultures, might therefore be important for scaling-up specific 'one-off' Lean projects into *processes* that can be sustained (Radnor et al., 2012). As noted by Day and Norris (2007) in their analysis of the implementation of a national EMR, building small-scale success into system-wide change requires all staff to be able to identify and relate with leaders of their choice. Coupling policies that promote a more traditional top-down perspective with a bottom-up understanding of leadership may therefore enable staff engagement across organizations and subcultures to build on local successes, and to generate positive conditions for sustaining large-scale change (Day and Norris, 2007).

3.4 *Promote staff engagement*

Staff engagement occurs when people feel listened to and are able to have a real impact on the change process (Saul et al., 2014). The literature describes multiple interventions that may be used to engage staff in cultural change activities, such as focus groups, unit level improvement teams, brainstorming sessions, completion of small-scale projects

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with rapid feedback of results, on-site visits, teleconferences, individual consultations, or electronic communities of practice (Berger, 2004, Pearson et al., 2009). Specifically, Lean methodologies provide a range of vehicles for engaging staff, including Rapid Improvement Events (RIE) and Rapid Process Improvement Workshops (RPIW) that have been reported to be important for engaging leaders and frontline staff, as well as solidifying social networks and developing improvement ideas (Nelson-Peterson and Leppa, 2007, Radnor et al., 2012, DelliFraine et al., 2010). Such interventions are thought to be important for bridging organizational subcultures through exchanging ideas, building shared narratives and fostering a collective understanding of organizational vision, goals, and perspectives (Bloor, 1999). Participation in these activities may be fostered through incentive systems that involve a range of financial and non-financial rewards, including salary supports, pay-for-performance programs, specific training opportunities, time-release options, public recognition, or even organized workplace social events (Berger, 2004). The most appropriate incentive system for promoting staff engagement will be tailored to relevant contextual factors that similarly influence existing organizational cultures and subcultures.

3.4.1 Contextual factors

Engaging staff requires contexts where communication channels support and encourage ongoing flows of dialogue and engagement between staff at all levels of the organizational hierarchy and between organizational subcultures (Chreim et al., 2010). Organizational policies that support such communication channels may be particularly important in times of change, such as when creating or redefining roles or refining

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organizational vision. Whether formal change managers are employed to engage staff at all levels (Chreim et al., 2010), or whether staff position descriptions are modified to include responsibility for change management (Berger, 2004), clearly defining how all staff will be involved and engaged in sustaining change is an important contextual element.

Similarly to distributed leadership, interventions targeting staff engagement can result in contextual changes to power structures and power dynamics. As a result, staff that engage in change processes may feel more empowered and supportive of change efforts, while those who choose to avoid engagement may present greater resistance (Bevan, 2012, Greenhalgh et al., 2012, Chreim et al., 2010, Ogbonna and Harris, 1998). Resistance to change from an un-engaged staff can result from legitimate fears, anxieties and concerns. In their analysis of organizational and cultural change in the private, for-profit sector, and the public, non-profit field, Austin and Claassen describe worker resistance when change is perceived as a "threat to professional practices, status or identity" (Austin and Claassen, 2008). Introducing change in ways that fail to consider these deeply help professional values and identities for individuals and subcultures, may therefore contribute to a sense of loss (Austin and Claassen, 2008), potentially resulting in negative or unpredictable behavior from individuals and groups (Scott et al., 2003). For Lean methodologies, resistance to engagement may arise from a perceived misfit between Lean process improvement strategies and patient care (Nelson-Peterson and Leppa, 2007). In their review of patient safety improvement strategies (which included Lean methodologies), Burston et al. noted the impact of non-engaged frontline staff, who

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often viewed quality improvement interventions “as yet another ‘program’ to be tolerated until superseded” (Burston et al., 2011).

3.4.2 Mechanisms

Key to initiating and sustaining change is understanding how best to work with the range of possible emotional responses to large scale change, and how to make optimal use of existing social connections among staff members within particular groups (Wilson, 2010). Scott et al. suggest that a critical mass is needed to generate ‘buy-in’ into the change process (Scott et al., 2003), leading to hope and optimism that lasting change is achievable (Bevan, 2012). Engagement allows staff to obtain rapid feedback on how small changes are working, to understand how to integrate change into their work roles, and to identify potential sources and reasons for resistance to change. In addition, Wilson proposes that the route to improved front line clinical engagement is likely to occur through building a shared narrative that engages listeners as story tellers, in a spirit of organizing rather than mobilizing, converting or coercing (Wilson, 2010).

Despite the impact of staff engagement on implementing and sustaining organizational culture change (Pearson et al., 2009), it is often difficult to maintain. In their analysis of a multi-phase, multi-site nursing redesign project, Pearson et al. described decreasing commitment to engagement over time, competing demands from other units and the constant introduction of new programs or procedures, as major barriers to maintaining clinical staff engagement in change activities (Pearson et al., 2009). Moreover, engaging front line staff in decision-making, such as is promoted by Lean methodologies, may

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represent a shift in traditional roles of leadership teams, as control is relinquished in favor of more support-oriented positions (Perez et al., 2009, Parkerton et al., 2009).

3.5 *Create collaborative interpersonal relationships*

In describing efforts to shift cultures in emergency and urgent care services in the NHS in Scotland, Dattee & Barlow highlighted the importance of interventions that promote collaboration and raise awareness of organizational and inter-organizational functional interdependencies (Dattee and Barlow, 2010). This includes planned coordination, through distributed leadership models, which helps to build integration within and among organizations, disciplines and professions (Lukas et al., 2007). Such coordinating efforts may be enhanced through organizational policies that promote new (and sometimes overlapping) roles and responsibilities, or task forces, problem-specific committees, or learning groups that support collaborative action, with time allocation and reward structures that encourage participation from a broad range of stakeholders (Dattee and Barlow, 2010). The resulting relationships may be of different intensities for different purposes. For example, while a diversity of casual acquaintances is thought to be helpful in diffusing ideas and new behaviors across large social distances (Wilson, 2010), creating strong, trust-based relationships between senior managers is vital for maintaining high level inter-organizational partnerships (Mannion et al., 2011). The inter-professional teams, collaborations and communications that are demanded by Lean methodologies (Poksinska, 2010) are therefore powerful tools for sustaining change in organizational cultures and subcultures.

3.5.1 Contextual factors

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Efforts to create collaborative interpersonal relationships will have most impact in settings that recognize the value of cross-sectoral work, that have considered conditions for how staff might engage in such work, and have begun to highlight the unique characteristics of particular organizational groups as well as the functional inter-dependencies that exist between these organizational units, departments or levels (Lukas et al., 2007). Such settings may be recognized through engagement with individuals from across organizational units, reviewing key organizational policies, mission or vision statements, or other organization specific documents that describe past/present strategic planning activities. Understanding these inter-unit relationships and interactions has important implications for conceptualizing how Lean 'value streams' (that can influence different units), may result in both positive and negative effects in multiple areas (Poksinska, 2010). Nurturing trust based relationships help create conditions by which these changes may be anticipated and understood, and allow the assembly of "governance arrangements and business plans which cut across organizational and sectoral boundaries" (Greenhalgh et al., 2012). Contexts that have invested in building a variety of relationships, such as those for mentoring or collaboration, might also help to lessen the impact of potentially dysfunctional power dynamics between organizational subcultures and groups. As noted by Chreim et al., "the elements of quality relationships and trust can be a substitute for bureaucratic and formal control mechanisms" (Chreim et al., 2010).

3.5.2 Mechanisms

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Creating collaborative interpersonal relationships, in contexts that are at least aware of the functional and structural divisions of their organizations, can help create channels for socially reinforcing changes in culture and practice (Wilson, 2010), generating trust and assisting to combat and neutralize resistance to change (Chreim et al., 2010). This may occur through groups developing a shared sense of what a problem means in a given context, rallying efforts around that change, and allowing individuals and organizational groups to contribute to an evolving narrative of change in a way that inspires rather than promotes fear of change (Table 2) (Wilson, 2010).

While much focus is placed on building supportive interpersonal relationships, Detert and Pollock note the impact of relationships based on coercive power (Detert and Pollock, 2008). Through a longitudinal, multi-method analysis of total quality management in the education sector, Detert and Pollock highlight the capacity of coercive factors in "unfreezing actors" when external conditions demand internal organizational change (Detert and Pollock, 2008). However, these authors also question the capacity of coercive relationships for institutionalizing change, finding that such relationships not only inhibit "cognitive institutionalization of the desired behaviours but also the ability [of workers] to even engage in some of the desired behaviours" (Detert and Pollock, 2008).

3.6 Continually assess and learn from cultural change

Multiple approaches exist for assessing change in organizational culture, including quantitative (e.g. Survey of Organizational Culture), qualitative (e.g. in-depth interviews

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or focus groups) and mixed methods approaches (e.g. concept maps, combined qualitative/quantitative methods) (Mannion et al., 2010). These assessments attempt to capture the tangible and intangible elements of culture, including relevant structural, procedural and outcome targets (Atchison, 1999). How these data are used to influence policy making (and via what feedback processes) is important for influencing the implementation and sustainability of complex change activities (Vest and Gamm, 2009, Baker et al., 2003). As noted by Vest and Gamm (Vest and Gamm, 2009), rarely are such cultural changes explicitly identified or assessed in investigations of Lean process improvements.

While this review focuses on measures for assessing culture change, such approaches may occur alongside other process and outcome measures as system transformation takes place. These process and outcome measures (which in the case of Lean include patient throughput, error reduction, patient and employee satisfaction, and reduced costs),(Poksinska, 2010) may be powerful drivers for sustaining transformative efforts, particularly in clinical care settings where progress toward defined process and outcome targets is regularly monitored and reported.

3.6.1 Contextual factors

Efforts to assess culture change may be time and labour intensive. Organizational contexts that recognize and make available the resources required for conducting cultural assessments (of both organizational culture and subcultures) will be optimally placed to foster environments that support learning as well as accountability (Loftus, 2010). Over

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time, processes to engage staff in data collection may help create environments where ownership of data is shared among staff, reinforcing a learning environment. As per efforts to engage staff and build collaborative relationships, efforts to assess culture change need to operate within the contexts of competing demands and existing power distributions to build capacity and organizational learning (Table 2).

3.6.2 Mechanisms

In environments with supportive policies, available resources and work models that promote staff engagement in culture assessment exercises, data analysis can help capture the multiple perspectives of why cultural change is needed, what that change entails, how that change is implemented, and how it is sustained (Ogbonna and Harris, 1998). In describing the cultural transformations of the Owensboro Mercy Health System and Clarion Health Partners, Atchison highlights how measures of the tangible and intangible elements of cultural change captured both the perceptions and motivations of different staff from different subcultural groups (Atchison, 1999). In these examples, repeated use of valid and reliable cultural metrics allowed even “small changes [to be] recognized, celebrated, preserved and fostered” (Atchison, 1999). When linked to incentivizing systems, or used to strengthen accountability of leadership teams, ongoing assessment strategies using such metrics can provide motivation to maintain or improve change efforts (Bevan, 2012, Berger, 2004). While Lean process improvements require the collection of relevant process improvement and outcomes data, taking Lean to a system-wide level will demand an understanding (gained through measurement and feedback) of associated cultural changes.

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Despite the value and utility of these data, the change management process may break down due to a number of factors, including "complacency and lack of a disciplined feedback loop" (Atchison, 1999). While culture change efforts may create constructive and positive impacts, they may also generate a range of unintended consequences, such as those described as part of the NHS' shift to a culture of performance management: e.g. neglect of unmeasured domains, data falsification, complacency with 'satisfactory' performance, and a focus on short-term results rather than long-term change (Scott et al., 2003). Therefore, tangible and intangible measures of cultural change, while powerful tools for influencing commitment to cultural transformation, require feedback structures that ensure data reach those in positions to act and in ways that enable them to do so.

4. DISCUSSION

This review identified six guiding principles that may be useful when considering organizing efforts and policies to sustain cultural change in health systems: (1) align vision and action; (2) make incremental changes within a comprehensive transformation strategy; (3) foster distributed leadership; (4) promote staff engagement; (5) create collaborative relationships; and (6) continuously assess and learn from cultural change. These guiding principles interact with various contextual factors, resulting in activation of different mechanisms to influence sustainability of large-scale changes in organizational culture.

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The findings from this review help to focus attention on how those working in complex organizations and systems like those in Saskatchewan, can practically support and sustain cultural transformation, including those transformations being pursued through Lean methodologies. The principles from this review resonate with previous reviews of Lean, including the single realist review of Lean in health settings which highlighted the importance of staff engagement, working to bridge functional divides, focusing on the value derived for patients and customers, and nurturing a long-term view of improvement (Mazzocato et al., 2010). The review by Mazzocato et al. highlights the often technical and narrow view of previous publications on Lean, rather than the broader holistic view that is needed to generate significant and enduring organization or systems wide change. This is consistent with a critique by Vest and Gamm, who propose that sustained transformation requires both practice (or technical) change as well as cultural change (Vest and Gamm, 2009), noting “the inability of many organizations to ensure transformation along both these dimensions may explain a number of previous failings of lauded approaches like process reengineering or continuous quality improvement (CQI)”(Vest and Gamm, 2009). As noted, these assertions are in keeping with existing critiques of Lean in health settings, that propose a key barrier to wider system adoption and impact is a restrictively narrow focus on Lean tools, techniques and processes rather than system strategy (Radnor et al., 2012, Mazzocato et al., 2010). As a result, “developing a culture of ongoing improvement and structural problem solving” is often neglected in Lean initiatives (Radnor et al., 2012). The guiding principles identified in the present study are therefore useful contributions for understanding how a broader

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perspective may be brought to Lean initiatives with a vision of sustaining culture change, in addition to technical and procedural advances.

Focusing exclusively on the cultural changes associated with Lean (or any other improvement activity) at the level of the organization is unlikely to capture or understand the changes also taking place at the level of organizational subcultures. Subcultures forming along professional lines, geographic locations, functional orientations or demographic characteristics (such as age, gender, ethnicity) can exert powerful effects on individuals and organizations (Lok et al., 2011). The guiding principles identified in this analysis for sustaining organizational cultural change have relevance to sustaining change within and among organizational subcultures, including: aligning organizational vision with subculture action, creating opportunities for staff engagement across distinct groups, promoting distributed leadership with leaders that resonate with subcultural perspectives, and investing in communication systems that allow for ongoing exchanges of ideas. While this analysis has not attempted to investigate the particular effects of the identified principles across different subcultural groups, any effort to promote cultural change (either within organizational culture or organizational subcultures) needs to tailor strategies to suit particular organizational contexts and sub-group conditions.

As noted, the six guiding principles identified in this review, while not Lean specific, resonate with existing literature on LST and cultural change, highlighting the important roles of leadership, feedback mechanisms, broad engagement, simplicity, and the roles of measurement (Best et al., 2012, Austin and Claassen, 2008, Buchanan and Fitzgerald,

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2007). These principles are not a comprehensive guide for sustaining cultural change: rather they offer a variety of interrelated actions on which change agents may draw as transformation unfolds. Such principles may be more useful than exhaustive checklists or specific instructions for guiding policy formulation related to fostering cultural change and LST (Best et al., 2012). Yet as noted by Buchanan, “there is no simple policy directive or effortless management strategy to guarantee either the durability of new working practices or their wide and rapid spread” (Buchanan and Fitzgerald, 2007). Therefore, those involved in developing policy for large scale cultural change, such as involved with Lean implementation, might make most use of this review (and the others that have preceded it) as a companion of change: containing ideas that may be revisited over time, interpreted in light of changing local contexts and conditions, which are sufficiently flexible to inform the selection of policy actions that are responsive to shifting circumstances and internal/external pressures. Given many managers in complex organizational settings are unable to “completely control the complex interactions that produce culture throughout an organization”(Hodges and Hernandez, 1999), such practical and flexible approaches to informing policy for sustaining cultural change might prove particularly useful.

However, this review has not attempted to examine the interactions between the identified guiding principles. For example, efforts to align vision with action are likely to be influenced by changes to leadership activities and structures that distribute leadership duties across organizational members with varying roles and responsibilities. Engaging staff in the change process is also likely to require similar activities as building

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collaborative relationships with internal and external partners. Examining how these six principles are related, and how synergies among them may be leveraged for greater sustainability may be best explored through detailed case studies of example systems in times of change (such as in Saskatchewan). This would enable deeper insights to be gained into the dynamic nature of culture change and sustainability over time.

This study has two primary limitations. Firstly, while the literature search was rigorous and systematic, our results cannot be viewed as a comprehensive list of factors that influence cultural change and its sustainability. In contrast, the principles identified in this review are a part of an ongoing dialogue which is advancing our understanding of what works, for whom, in what contexts and why.

Secondly, information related to contexts, mechanisms and cultural 'outcomes' are not routinely well described in available documents (peer reviewed or grey literature). Consequently, the fine-grained details useful for establishing I-C-M-O relationships are often lacking. In particular, details relating to the cultural 'levels' at which changes take place, are rarely described (in terms of assumptions, values/beliefs or cultural artifacts). As a result, the 'outcome' in this analysis has been considered the cumulative changes occurring to multiple cultural layers: this cumulative perspective of cultural outcomes may hide the specific pathways by which interventions are acting to influence different cultural outcomes.

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Moreover, the complex and contested nature of what mechanisms truly are continues to challenge reviewers interested in understanding not just what works, but how things work. As a result of challenges in identifying contextual factors, associated mechanisms and cultural outcomes, other review teams may not replicate precisely the findings or interpretations of our analysis. However, ongoing engagement with the expert and reference panels in understanding and refining our data provides a degree of confidence in the consistency of our analysis.

This review had a number of strengths. Adopting a narrative approach informed by realist concepts was a highly ‘fit for purpose’ approach for synthesizing the literature, and meeting the needs of the Ministry. Other forms of systematically synthesizing an evidence base (such as methods proposed by Cochrane reviews) would not have generated these insights.

The knowledge users of this review were engaged from the beginning (including in securing funding for the review), ensuring the process was grounded in their informational needs. As a result, this review provides a timely example of a co-produced knowledge synthesis, embedded in the activities of those actively undertaking system transformations. As noted by Van de Ven (Van de Ven, 2007, Van de Ven and Johnson, 2006), these types of co-produced efforts are more likely to add value to the transformation process than more independent activities. The value of this review to decision makers in Saskatchewan is likely to be understood in the months and years ahead as Lean implementation and cultural transformation evolves.

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Not all types of change, including cultural change, are important or desirable to sustain. While we have focused this review on actions that might be associated with sustaining change, it is equally important to ensure that these efforts are directed towards areas of desirable change. In this spirit, "it is clear that some changes should be allowed, if not encouraged, to decay. Circumstances evolve, and rigid methods that are not adaptable prevent staff from implementing further relevant changes and improvements" (Buchanan and Fitzgerald, 2007). A future avenue of enquiry may explore how such non-desirable change may be identified. Furthermore, future studies may be able to explore the relationship between the guiding principles identified here and the specific layers of cultural change.

5. CONCLUSIONS

There are many factors influencing how culture in organizations changes and the degree to which those changes are sustained. The six guiding principles identified in this review may provide health system leaders with useful ways of engaging in the process of cultural change, which may yield positive changes. Health care leaders are encouraged to interpret and adapt these principles in the contexts of their own local health settings, and explore which activities and policies make most sense given local constraints and opportunities. Through continued sharing of experiences in implementing these guiding principles, combined with clear accounts of how they interact with key contextual factors, an improved understanding of cultural sustainability may be gained.

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Competing Interests

The methodology described in this paper is designed to bridge multisectoral barriers to knowledge use. Although the authors have academic interest in this methodology, they also engage in the methodology as consultants on a range of projects. Some of these projects are funded by grants managed by universities, some through contracts to the InSource Research Group. InSource was created to provide a vehicle for responding to policy maker needs for knowledge synthesis in a more timely way than is possible through the normal grant funding process. In the interests of transparency and to address conflict of interest concerns, it is very possible that publication of this paper could enhance InSource's reputation and could result in future contracts for the company. It must also be noted that two of the 11 authors (JB and AB) are InSource directors, and another two (JS and CW) have worked, or in the future may work, under contract to InSource. In sum, the authors may receive financial gain in the future from the publication of this manuscript. In our view, the conflict between academic and business interest in this area is unavoidable, and bridging the gap between these interests is vital to supporting the research to policy and practice process. The evidence is clear that knowledge uptake is poor without effective structures to support the process. No other authors have any conflicts of interest to declare.

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Author Contributions

CDW assisted in establishing reference and expert panels, developing research questions and directions, developing the search strategy, screening relevant articles, extracting data, developing/validating synthesized themes, and led the drafting/revisions of the manuscript. JS assisted developing research questions and directions, led the development of data extraction tools, extracted data, synthesized themes across included studies, and helped draft/revise the manuscript. EC and EJ assisted in developing data extraction tools, extracted data using these tools, assisted in interpreting synthesized themes, and contributed to the drafting of the manuscript. JB provided project management support, assisted in establishing reference and expert panels, screened documents, extracted data and helped draft/revise the manuscript. AB assisted in establishing reference and expert panels, assisted in developing research questions and directions, finalizing data collection and extraction processes, and contributed to the drafting/revising of the manuscript. MAS, HB and RM assisted in interpreting results from the thematic synthesis and drafting/revising of the manuscript. TG chaired the expert panel for the duration of the project and assisted in interpreting results from the thematic synthesis and drafting/revising of the manuscript. DH chaired the reference panel, assisted in interpreting results from the thematic synthesis and drafting/revising of the manuscript.

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TABLES

Table 1: Inclusion and exclusion criteria

Criteria	Description
Inclusion Criteria	
1	Article discusses the sustainability of transformations to organizational culture at the organizational or multi-organizational level (systems); OR
2	Article discusses organisations/systems in the process of change and/or evaluations of long-term change (long-term change to be recorded as defined by each article).
Exclusion criteria	
1	Article is only about safety culture or safety climate; OR
2	Article does not discuss the sustainability of cultural transformations, or the role of leadership/management in implementing cultural change; OR
3	Article does not contain material at the organizational or systems level (e.g. solely reports on activities at the unit, department level); OR
4	Definition of sustainability relates only to a single alternative concept other than cultural change, e.g. environmental sustainability, continuation of financial support, sustainability of individual behavioural change etc; OR
5	Article solely discusses the implementation, sustainability or influence of specific technologies on clinical outcomes; OR
6	Article solely discusses the implementation, sustainability or influence of specific health programs. Note: Program in this context is considered to relate to specific interventions (narrowly defined). If the program described relates to a more system wide initiative, it will be included; OR
7	Article solely discusses organisations preparing for change, e.g. organisational readiness; OR
8	Article is from a low-middle income country and/or a setting with few similarities to the Saskatchewan context.

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Table 2: Intervention, context, mechanism combinations for sustaining organizational cultural change

Guiding Principles and specific interventions	Relevant contextual factors	Relevant mechanisms	Relevant citations
1. Align vision and action • Create consistent plans, processes, information, resources • Implement incentives • Provide training • Use contextually relevant and effective communication tools • Allow for mid-level action	*Enabling factors:* • Perception of change as legitimate and credible • Pre-existing values and beliefs • Dynamics of power distribution and loyalty *Constraining factors:* • Perception of change as illegitimate and non-credible • Large divergence from pre-existing values and beliefs • Insensitive to dynamics of existing power bases and loyalty structures	• Prompts action from redefined roles • Fosters use of common program language • Encourages incentives and targets • Requires authority, expertise and trust of integration teams • Provides bridges between professional groups • Fosters a sense of legitimacy, cultural humility, willingness to engage and mutual respect	• Amis et al.(Amis et al., 2002) • Bellot(Bellot, 2011) • Berger(Berger, 2004) • Bevan(Bevan, 2012) • Carney(Carney, 2011) • Chreim et al.(Chreim et al., 2010) • Connolly & Smith(Connolly & Smith, 2010) • Coustasse et al.(Coustasse et al., 2007) • Dressendorfer et al.(Dressendorfer et al., 2005) • Edwards et al.(Edwards et al., 2007) • Gibson & Barsade(Gibson & Barsade, 2003) • Gollop et al.(Gollop et al., 2004) • Lok & Westwood(Lok et al., 2011) • Lukas et al.(Lukas et al., 2007) • Meyer et al.(Meyer et al., 2010) • Nolan(Nolan, 2005) • Schein(Schein, 2010) • Sheaff et al.(Sheaff et al., 2010) • Studer(Studer, 2003) • Wilson(Wilson, 2010) • Yano et al.(Yano et al., 2007)
2. Make incremental change • Small changes building on each other • Institutionalization of change as it unfolds • Simple actions and gradual roll out	*Enabling factors:* • An organization's sense of experimentation • Ability to maintain focus on sustained process of change, with changing practices *Constraining factors:* • Perception of change as illegitimate and non-credible	• Allows broad participation (activation staff engagement mechanisms) • Builds shared ownership • Allows flexible levels of involvement • Allows success to be recognized • Builds staff awareness of skills • Allows staff adaptation to change	• Austin & Claasen(Austin & Claassen, 2008) • Buchanan et al. 2007(Buchanan & Fitzgerald, 2007) • Buchanan et al. 2005(Buchanan & Fitzgerald, 2005) • Day & Norris(Day & Norris, 2007) • Edwards et al.(Edwards et al., 2007) • Macfarlane et al.(Macfarlane et al., 2011) • Nolan(Nolan, 2005)
3. Foster distributed leadership • Create designated and	*Enabling factors:* • Staff freedom to engage in leadership	• Activates shared sense of energy • Fosters psychological safety • Fosters buy-in into small project	• Berger(Berger, 2004) • Best et al.(Best et al., 2012) • Brown et al.(Brown & Duthe, 2009)

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varying leadership roles • Identify non-leaders • Build teams of leaders	• Environment supportive of pro-active management • Organizational support for leadership duties *Constraining factors:* • Degree of bureaucracy, confusion and resentment/resistance • Insensitive to dynamics of existing power bases and loyalty structures	wins • Allows identification with leaders of choice	• Buchanan et al. 2007(Buchanan & Fitzgerald, 2007) • Buchanan et al. 2005(Buchanan & Fitzgerald, 2005) • Burston et al.(Burston et al., 2011) • Chreim et al.(Chreim et al., 2010) • Coustasse et al.(Coustasse et al., 2007) • Dickinson et al.(Dickinson et al., 2007) • Dixon-Woods et al.(Dixon-Woods et al., 2012) • Emmons et al.(Emmons et al., 2012) • Furtado et al.(Furtado et al., 2011) • Gronn(Gronn, 2002) • Harrison & Kimani al.(Harrison & Kimani, 2009) • Kaplan et al.(Kaplan et al., 2010) • Kimberly & Cook(Kimberly & Cook, 2008) • Lok & Westwood(Lok et al., 2011) • Lukas et al.(Lukas et al., 2007) • Mannion et al. 2005(Mannion et al., 2005) • Masso et al.(Masso et al., 2010) • McGrath et al.(McGrath et al., 2008) • Meyer et al.(Meyer et al., 2010) • Morjikian et al.(Morjikian et al., 2007) • Scott et al.(Scott et al., 2003) • Sibthorpe et al.(Sibthorpe et al., 2005) • Sirio et al.(Sirio et al., 2003) • South(South, 2004) • Studer(Studer, 2003) • Vest & Gamm(Vest & Gamm, 2009) • Wilson(Wilson, 2010)
4. Promote staff engagement Potential interventions: • Focus groups • Improvement teams • Brainstorming • Site visits • Teleconferences	*Enabling factors:* • Availability of communication channels • Readiness to engage • Recognition of change agency roles • Willingness to relinquish control	• Ensures staff feel listened to and empowered • Recognizes threats to professional identity • Respects range of emotional responses to change • Makes optimal use of social	• Austin & Claasen(Austin & Claassen, 2008) • Berger(Berger, 2004) • Bevan(Bevan, 2012) • Burston et al.(Burston et al., 2011) • Chreim et al.(Chreim et al., 2010) • Connolly & Smith(Connolly & Smith, 2010) • Dixon-Woods et al.(Dixon-Woods et al., 2012)

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• New roles and responsibilities	• Commitment over time • Sensitivity to dynamics of power distribution and loyalty *Constraining factors:* • Degree of staff resentment/resistance • Competing demands • Presence of legitimate fears and anxiety • Insensitive to dynamics of existing power bases and loyalty structures	connections • Fosters hope and optimism that change is possible	• Drenkard(Drenkard, 2001) • Galambos et al.(Galambos et al., 2005) • Gollop et al.(Gollop et al., 2004) • Greenhalgh et al.(Greenhalgh et al., 2012) • Kaplan et al.(Kaplan et al., 2010) • Kingsley(Kingsley, 2001) • Lukas et al.(Lukas et al., 2007) • Ogbonna & Harris(Ogbonna & Harris, 1998) • Pearson(Pearson et al., 2009) • Parkerton et al.(Parkerton et al., 2009) • Parsons(Parsons & Cornett, 2011) • Perez(Perez et al., 2009) • Scott et al.(Scott et al., 2003) • Sheaff et al.(Sheaff et al., 2010) • Wilson(Wilson, 2010)
5. Create collaborative interpersonal relationships • Task forces • Problem specific committees • Learning groups • Invest in relationships of different intensities • Retain long serving staff	*Enabling factors:* • Supportive organizational mission statements (including reward and incentive structure) *Constraining factors:* • Insensitive to dynamics of existing power bases and loyalty structures	• Creates channels for socially reinforcing change • Generates trust • Neutralizes resistance to change • Creates shared sense of problem • Allows individuals and group involvement • Coercive forces can unfreeze actors as well as inhibit sustainability	• Bradley et al.(Bradley et al., 2003) • Braithwaite et al.(Braithwaite et al., 2005) • Chreim et al.(Chreim et al., 2010) • Dattee & Barlow(Dattee & Barlow, 2010) • Detert & Pollack(Detert & Pollock, 2008) • Dickinson et al.(Dickinson et al., 2007) • Dixon-Woods et al.(Dixon-Woods et al., 2012) • Drenkard(Drenkard, 2001) • Gollop et al.(Gollop et al., 2004) • Greenhalgh et al.(Greenhalgh et al., 2012) • Kimberly & Cook(Kimberly & Cook, 2008) • Mannion et al. 2011(Mannion et al., 2011) • Morjikian et al.(Morjikian et al., 2007) • Sibthorpe et al.(Sibthorpe et al., 2005) • Wilson(Wilson, 2010)
6. Continually assess and learn from cultural change • Quantitative tools • Qualitative approaches • Mixed methods techniques • Tangible and intangible data elements	*Enabling factors:* • Perceived organizational value of data (can be changed through reward structures) • Environment built around shared data and data ownership • A supportive learning	• Promotes identification and celebration of measured change • Provides extrinsic motivation for change • Feedback structures provide data to those who can act	• Atchison et al.(Atchison, 1999) • Baker et al.(Baker et al., 2003) • Bellot(Bellot, 2011) • Berger(Berger, 2004) • Bevan(Bevan, 2012) • Bradley et al.(Bradley et al., 2003) • Casebeer & Hannah(Casebeer & Hannah, 1998)

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• Use of feedback	environment *Constraining factors:* • Competing demands • Dynamics of power distribution	• Galambos et al.(Galambos et al., 2005) • Gibson & Barsade(Gibson & Barsade, 2003) • Julian & Kombarakaran(Julian & Kombarakaran, 2006) • Kaplan et al.(Kaplan et al., 2010) • Kimberly & Cook(Kimberly & Cook, 2008) • Loftus et al. 2010(Loftus, 2010) • Mannion et al. 2010(Mannion et al., 2010) • Masso et al.(Masso et al., 2010) • Ogbonna & Harris(Ogbonna & Harris, 1998) • Pellegrin & Currey(Pellegrin & Currey, 2011) • Vest & Gamm(Vest & Gamm, 2009)

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Figure 1: Lean Management in Saskatchewan

A number of important steps and contextual factors have contributed to the initial adoption and subsequent spread of a disciplined Lean Management approach within Saskatchewan:

- Strong, clear and unequivocal political support for Lean within the Province from the Minister of Health and the Premier.
- Patient First Review (2009) that emphasized the patient at the center of transformative work within the Saskatchewan health system. The review was instrumental in beginning to shift thinking towards a culture of continuous quality improvement.
- Lean implemented incrementally:
    - 2008: Lean implemented in the Ministry of Health;
    - 2009: Lean implemented within regional health authorities
    - 2011: Recognition that the health system lacked the necessary infrastructure and capacity to sustain Lean efforts, leading to the engagement of external consultants to ensure a rigorous and disciplined approach to continued Lean Management.
- Since 2011: significant progress made on building the necessary infrastructure and improvement capacity to support continuous improvement efforts across the province, including:
    - Establishment of Six Kaizen Promotion Offices across Saskatchewan;
    - Establishment of a Provincial Kaizen Promotion Office to monitor and coordinate provincial efforts (under the responsibility of the Saskatchewan Health Quality Council);
    - Intensive training for leaders and staff within the health system to increase internal capacity. Eighty days of 'learn through doing' training, including 10 classroom-based training days, with the remainder involving hands on improvement work (e.g. Rapid Process Improvement Workshops, value stream mapping events, etc.) Training occurs over an 18-24 month period. Currently there are 467 health system leaders, representing 18 organizations, involved in Lean leader certification.

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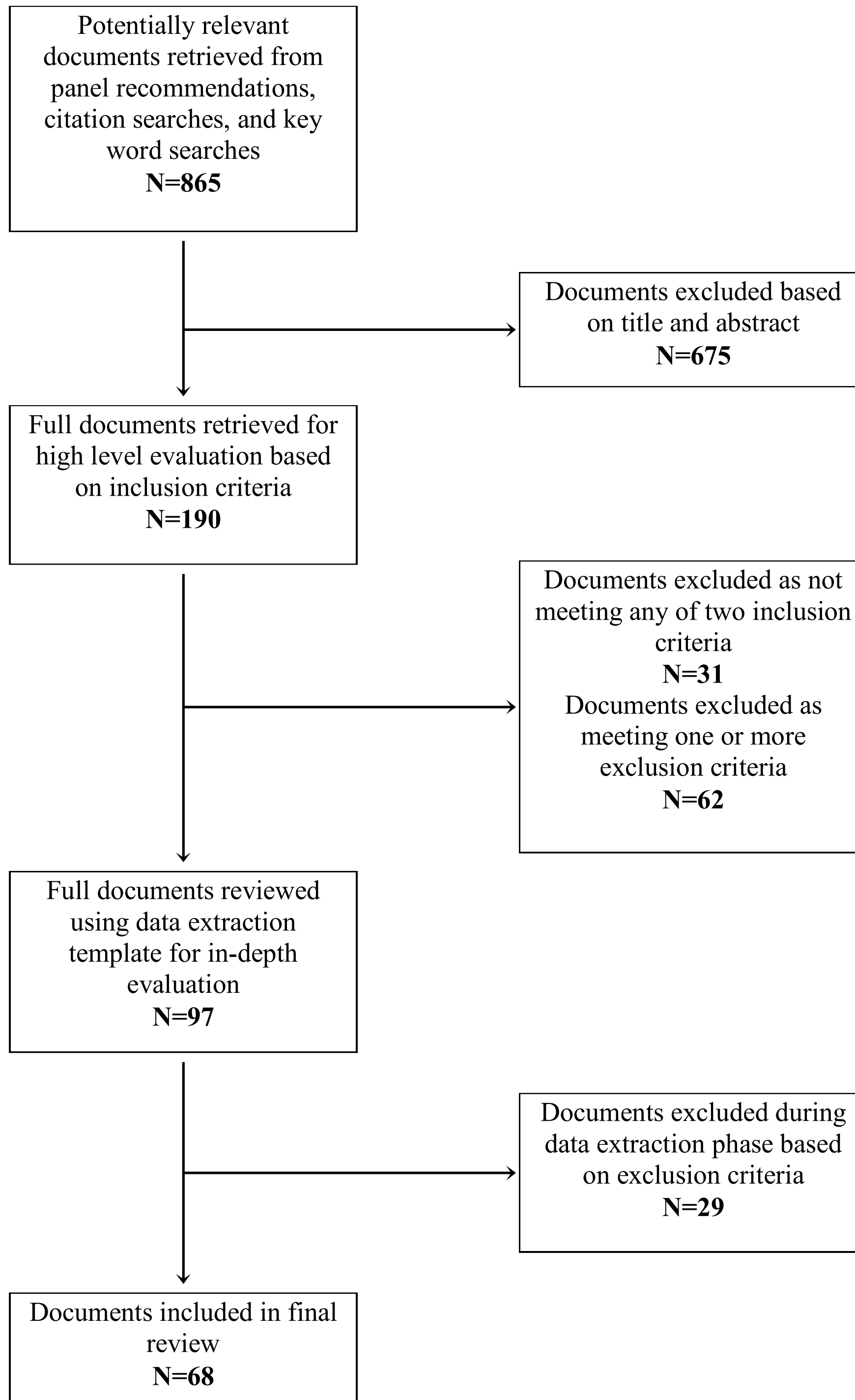
Figure 2: Flow chart of document inclusion and exclusion processes



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