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A Qualitative Exploration of Sustainability Processes for Improvement: The Role of Structured Sustainability Tools

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Introduction

Making change in complex health systems often results in unpredictable and unexpected challenges (Plsek et al. 2001). Health systems are made up of diverse programmes, actors, organisational practices and interventions which often represent different professional and organisational boundaries, and which are often dependent on each other for optimal care coordination (Plsek et al. 2001). Interactions among system stakeholders occur under constantly changing conditions replete with uncertainty and surprises (Dovers 1996; Fiksel 2007; Shigayeva and Coker 2015). Such

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unpredictability poses a significant challenge not only to successful implementation of interventions but also to the sustainability of changes within these environments (Greenhalgh et al. 2004; Stirman et al. 2012).

Healthcare organisations engage in a wide range of initiatives aimed at transforming and improving health and care services. Unfortunately, it is now well recognised that demonstrated success of an initiative does not ensure a programme's maintenance beyond its initial funding (Savaya et al. 2009; Williams et al. 2015). Despite significant resources invested in improvement initiatives, approximately only one-third of initiatives show evidence of sustainability and spread, and few maintain all aspects originally implemented (NHS Modernisation Agency 2004; Maher et al. 2010; Stirman et al. 2012). Many factors determine whether improvement efforts succeed or fail (Chaudoir et al. 2013). Factors such as dependence on external funding, unrealistic budgets, short-term grant funding, limited staff commitment, shifting organisational priorities and failure to change organisational culture have all been discussed in the literature as potential causes for initiative failure to be sustained (Goodman et al. 1993; Senge et al. 1999; Damschroder et al. 2009; Martin et al. 2012).

Initiatives that fail to sustain their improved outcomes or processes waste valuable human and monetary resources and contribute to unnecessary and inefficient variation across similar services (Shediac-Rizkallah and Bone 1998; Gruen et al. 2008). This has also been seen to cause staff, patients and the public to lose trust and enthusiasm for engaging in improvement programmes (Hovlid et al. 2012; Martin et al. 2012). Given the current economic climate, characterised by cost-cutting, healthcare organisations cannot afford to waste limited resources engaging in 'unsuccessful' improvement efforts (Healthcare Improvement Scotland 2013). Rising healthcare demands and competition for scarce resources have resulted in more healthcare managers and planners

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wanting to ensure the long-term impact of their investments (Stirman et al. 2012; Chambers et al. 2013). This has resulted in a growing interest in understanding how sustainability of initiatives can be influenced (Stirman et al. 2012; Chambers et al. 2013).

Prospective Exploration of Sustainability

Sustainability threats present across multiple stages of initiative planning, implementation and follow-up to influence sustainability outcomes over time (Shediac-Rizkallah and Bone 1998). While many studies on sustainability of improvement initiatives have been conducted, the majority of these studies investigate sustainability retrospectively (only after the end of the initial funding period) (Pluye et al. 2004; Savaya et al. 2009). This linear perspective on sustainability 'does not take account of the recursive or reflexive character of sustainability and learning or of the continuous adjustments that shape the sustainability process' (Pluye et al. 2004). To fully comprehend the process of achieving sustainability, a prospective approach is needed (Scheirer and Dearing 2011). This is because a prospective approach enables the influences on the sustainability of initiatives being played out in real times and places to be observed.

The concept of sustainability as a 'process' rather than an 'outcome' has been represented by some as a system's resilience or ability to respond to and recover from changes made within the environment (Dovers 1996; Fiksel 2007; Shigayeva and Coker 2015). Viewing sustainability as process incorporates concepts of 'adaptation, self-organization and learning' (Shigayeva and Coker 2015). This lens allows sustainability to be viewed as a change process that can be influenced by individuals throughout initiatives by continuing to develop and adapt in response to the needs of the system (Folke et al. 2002; Fiksel 2003; Shigayeva and Coker 2015). It also allows for guidance to improve initiative design and characteristics necessary to sustain particular interventions (Johnson et al. 2004). This has led many to recognise that in order to achieve sustainable improvement, actions and planning for sustainability must start during initiative implementation, long before the programme's funding ends (Pluye et al. 2004; Maher et al. 2010; Scheirer and Dearing 2011).

Studying sustainability throughout initiatives is complex as there is little consensus in the literature on what needs to be sustained and what constitutes 'achieving sustainability' (Shediac-Rizkallah and Bone 1998; Martin et al. 2012). The terms used in sustainability research prove a significant challenge because of multiple definitions, descriptions and meanings of sustainability. Sustainability of improvements is claimed to be a priority for most improvement initiatives, but the concept of what will be sustained is diverse (Altman et al. 1991; Shediac-Rizkallah and Bone 1998; Martin et al. 2012). This may include: continuation of the *health benefits* from an initiative. Others claim it takes the form of the continuation of *initiative activities*, or even the *capacity built* in the workforce or community (Shediac-Rizkallah and Bone 1998). More recently, the ability to adapt and continuously improve has also been recognised as a potential definition of sustainability (Moore et al. 2017). For the purposes of this work, 'sustainability' will refer to the general continuation and maintenance of a desirable feature of an improvement initiative and its associated outcomes, until such time when they are replaced with new evidence or more favourable interventions or processes.

The study of sustainability in ongoing improvement initiatives requires the analysis of sustainability 'by proxy'—that is, with identification of particular capabilities or characteristics hypothesised to be precursors of sustainability (Shigayeva and Coker 2015). To aid this analysis in practice, various models, frameworks and tools have been proposed (Glasgow et al. 1999; WHO 2004; Sirkin et al. 2005; Bowman et al. 2008; Feldstein and Glasgow 2008; Gruen et al. 2008; Chambers et al. 2013; Schell et al. 2013). Such sustainability tools attempt to render sustainability less complicated by breaking the concept down into manageable factors or constructs (Shediac-Rizkallah and Bone 1998; Bowman et al. 2008; Wiek et al. 2012).

Influencing Sustainability with a Structured Tool

To influence the sustainability process, improvement teams must have the ability to manage processes and respond to initiative needs; to collaborate across professional and institutional boundaries

with stakeholders to build relationships; to make informed decision about sustainability risks; and to plan actions to mitigate challenges (Shediac-Rizkallah and Bone 1998; Mancini and Marek 2004; Gruen et al. 2008; Maher et al. 2010; Lennox et al. 2017). Specific sustainability tools, such as a structured guide of principles to follow, have been proposed as a way to support these needs. Evidence for the use of sustainability tools currently relies on individual study findings which have reported anecdotal benefits of use. These hypothesised benefits include: improved understanding of the barriers and risks to sustainability; facilitation of the development of vision and mission for programs; building group consensus and initiative ownership; improving involvement of stakeholders; and providing an overview of the initiative that may not otherwise be monitored (Sarriot et al. 2004; Doyle et al. 2013; Calhoun et al. 2014). Considerable efforts are invested in the development and application of these tools. Therefore, there is a need to explore the role of sustainability tools in achieving these benefits and understand how using a structured sustainability tool may influence the sustainability process in improvement initiatives. Unfortunately, few sustainability tools have been studied in healthcare practice. This means that we have little evidence on if or how they may influence initiative processes and outcomes (Schouten et al. 2008; Stirman et al. 2012). The aim of this chapter is to understand the processes by which improvement teams influence sustainability in improvement initiatives using a structured sustainability tool.

Understanding Efforts Towards Sustainable Quality Improvement

This study will investigate the application of one sustainability tool: The Long Term Success Tool. The 'Long Term Success Tool' (LTST) was developed at The National Institute for Health Research Collaboration for Leadership in Applied Health Research and Care for Northwest London (CLAHRC NWL) in 2015 (Lennox et al. 2017). The tool was informed by literature and was developed with stakeholders and end-users to provide an evidence-based user-friendly approach,

for improvement teams to consider sustainability of their initiatives. The LTST aims to: 'support those implementing improvements reflect on 12 key factors to identify risks and prompt actions to increase chances of sustainability over time'. The tool includes a framework that identifies and describes factors for sustainability and a questionnaire to assess the factors. The factors assessed within the tool are: *Commitment to the improvement; Involvement; Skills and capabilities; Leadership; Team functioning; Resources in place; Evidence of benefits; Progress monitored for feedback and learning; Robust and adaptable processes; Alignment with organisational culture and priorities; Support for improvement;* and *Alignment with external political and financial environment* (Lennox et al. 2017).

As part of the broader project from which the study in this chapter derives, the 12 factors were rated on a 5-point Likert scale (from Very good to Very poor), as well as 'no opinion' and 'don't know' options. Each question includes an opportunity for free text comments for each factor. Improvement team members answer 12 questions within the tool individually and anonymously. As part of the larger project, individual scores were collated to produce team reports which include descriptive statistics, visual charts as well as comment lists for each factor. Because this chapter is intended to discern patterns of influence on sustainability of improvement initiatives, only qualitative data will be reported in this chapter.

Context and Cases

The LTST was applied within three diverse Quality Improvement (QI) Programmes across the UK throughout this work. A brief description of each programme is presented below. The use of three cases allows for the comparison of the tool across different contexts and settings. Programme 1 is a London-based five-year funded research programme supporting front-line care teams to implement evidence-based practice to ensure resonance across the research-practice boundary. The programme funds improvement initiatives that cover a diverse range of health topics and disease areas. The initiatives are undertaken across diverse healthcare

settings, including primary, secondary and community care. Initiatives run for approximately 18–24 months with the aim to have established improvements that will sustain beyond this period.

Programme 2 is a government-led initiative that involves supporting and implementing local, unscheduled care improvement teams in hospitals, to enhance coordination in the hospitals' care pathways, to deliver optimal patient care, as well as meet a four-hour Accident and Emergency Department targets across Scotland. This programme engages and supports healthcare teams to overcome challenges and provides targeted investment to support implementation with the use of local improvement teams. The programme delivers learning and improvement workshops where innovation and best practices are shared with improvement teams and QI skills are developed.

Programme 3 was set up in partnership between a health education network and an academic institution in Oxford, in the United Kingdom (UK). It aimed to promote continuous learning to support innovation adoption throughout the National Health Service (NHS). All programme participants were managers and clinicians from NHS organisations. The programme aimed to support participants to develop the tools and skills necessary to efficaciously introduce clinical innovations within their organisations. Participants of the programme designed and implemented an innovation project within their healthcare workplace settings. Table 12.1 describes the application of the tool across each programme.

We conducted a longitudinal mixed methods study. Data were collected across the three Quality Improvement (QI) Programmes in the UK from January 2015 to July 2017.

The LTST was used by the programmes at varying time intervals throughout the duration of their initiatives. Use ranged from two to six times throughout the study period. Tool responses were collected on a paper questionnaire form, online Qualtrics survey or on the CLAHRC NWL Web Improvement System for Healthcare (WISH) (Curcin et al. 2014). The first author observed improvement teams to identify how teams discuss sustainability within their projects, and how the tool was used in practice. Observation took both participant and non-participant forms and was conducted a sample of team meetings and workshops and involved discussion of perceived outcomes of the LTST us.

Table 12.1 Description of use and application of the LTST

Application	Programme 1 (P1)	Programme 2 (P2)	Programme 3 (P3)
Rationale for use	To identify issues to sustainability to aid in planning	Identifying areas for progress and needs of the project	Diagnosis for progress
Timing of use	Quarterly	Improvement workshops	Module sessions and in workplace
# of Improvement teams	11	19	26
Data collection	Paper or Online tool	Paper	Paper or Online survey
Data input	Team members (often project manager)	Facilitator	Project lead/ Project manager
Report generation	Online system	Facilitator	Facilitator
Feedback and discussion of reports	Team meetings and reviews	Workshops	Module sessions and in workplace

Semi-structured interviews were also conducted to gain in-depth understanding of perceived sustainability processes and actions. A purposive sampling strategy was used to recruit interviewees from across improvement teams. Participants were selected based on their role within diverse improvement projects and their level of knowledge of the project. This approach aimed to maximise the diversity of perspectives gained from the interviews (Onwuegbuzie and Leech 2007). Two researchers, the first author and two other CLAHRC NWL researchers, conducted the interviews in either a face-to-face format, via Skype or via telephone.

All interviews were professionally transcribed, and the observing researcher typed observational notes into electronic files. All transcripts, LTST reports and uploaded observation field notes were imported into qualitative research software NVivo 10 for analysis (QSR International Pty Ltd. 2016). Qualitative comments and actions made within the transcripts were analysed cyclically to explore contextual issues underpinning scores and discern thematic findings across programmes.

An iterative and inductive process guided the thematic analysis, in which data excerpts were compared and contrasted to provide increasingly abstract themes, which are illustrated in the following sections (Ritchie 1994; Braun and Clarke 2006; Vaismoradi et al. 2013). The research team collaboratively developed a preliminary coding structure, drawing on a framework of sustainability constructs as coding nodes, with themes on processes and actions inductively derived (Lennox et al. 2018). The coding structure was iteratively developed, integrated and refined as further data were added to the dataset (Elo and Kyngäs 2008). Findings are reported using narrative summaries and example quotes with explicit links to the original written texts.

Sustainable Improvement Through the Long Term Success Tool

During the study period, data were collected from 56 improvement teams across the three programmes. In total, 658 LTST responses were collected with over 2350 qualitative comments. Interviews were conducted with 34 improvement team members, and 37 hours of observation were undertaken.

Processes and Mechanisms to Sustain Improvement

The use of the LTST throughout initiatives supported three processes highlighted in the sustainability literature: *collaboration, decision- making* and *action planning* (Dovers 1996; Shediac-Rizkallah and Bone 1998; Mancini and Marek 2004; Fiksel 2007; Gruen et al. 2008; Dauphinee et al. 2011; Shigayeva and Coker 2015). We explored how the processes were supported by the tool and identified eight underlying mechanisms: *Identifying and engaging stakeholders; gathering team perspectives; giving people a voice; raising awareness; Identifying risks and needs; providing direction or focus; proposing actions; and taking action*. Each of these processes and mechanisms is discussed below.

1. Collaboration: Building Networks and Relationships

In order for QI initiatives to sustain they require collaboration between diverse stakeholders such as professionals and managers from different disciplines and patients and carers (Shediac-Rizkallah and Bone 1998; Mancini and Marek 2004; Gruen et al. 2008). Collaboration between these diverse groups allows shared understanding of the problem to be established and aids in the creation of responsive and effective interventions (Leffers and Mitchell 2011). Unfortunately, gaining commitment and continued involvement from diverse groups in health care can be challenging. Professional and personal boundaries between groups often have to be considered as these groups often have competing ideas and priorities (Wenger 1998; Lamont and Molnár 2002). The use of the tool across all sites appeared to promote and encourage collaboration among improvement teams. In this regard, we identified four mechanisms: *identifying and engaging stakeholders; gathering team perspectives; giving people the space to express opinions; and raising awareness*.

I. Identifying and Engaging Stakeholders:

Bringing together multiple stakeholders and working in collaboration were related to having the ability to reveal important links and interdependencies which would have otherwise remained hidden. The process of engaging colleagues was seen as an important practice taken on by multiple teams to maintain interest and support from stakeholders. Participants expressed how the use of the tool allowed them to speak to their colleagues about the project and provided them with the opportunity to engage members of their team who were less involved. Some participants commented that engaging colleagues to complete the tool was itself a challenge. Many participants were convening projects on their own. So, establishing who was on their 'team' proved difficult. These difficulties were seen to highlight the need for further engagement planning.

I think for us, it definitely gave us food for thought about how we get a wider reach… When we sat and looked around before filling it in, it did make me think: a) do you have two local improvement teams in each area? – because we don't have two local teams in each table completing this form. So, what do we need to do about that; how do we… make sure that we're engaging the right people? (P2_I34_Project R)

II. **Gathering Team Perspectives:**

The ability of the tool to provide a platform for users to share their views of the project was also highlighted as a mechanism influencing the degree of collaboration. In some cases, discussing results created a forum for teams to come together and recognise shared experiences which, in turn, fostered a sense of team cohesiveness and support. A number of participants recognised the importance of receiving feedback on the initiative from their colleagues and stakeholders. Such feedback was seen as crucial to understanding if the intervention was meeting needs and understanding what changes may be needed.

People have … learnt that it's OK to ask questions and to offer their knowledge, experience, advice into the mix and to not see it as a silo. (P1_I10_ Project Alpha)

It was a tool that really enabled us as a team to be more cohesive … because it really made us realise that they also feel the same. Like, oh, I'm not here on my own. (P1_I15_ Project Gamma)

III. **Giving People the Space to Express Opinions:**

The tool was also observed to be beneficial to teams as it permitted people to anonymously voice their unpopular or challenging opinions, and share concerns. Participants commented that the tool allowed some less confident team members to voice concerns without being criticised, which contributed to the openness of conversations.

It's the anonymity of it as well, which is the fact that, obviously, as a team member I'm quite outspoken, but there's a lot of people who aren't, and the fact that there is nobody that can interfere with your thoughts when you're completing that form is really important. (P1_I15_Project Gamma)

IV. **Raising Awareness:**

Many participants reported that awareness of their projects was limited, making building partnerships around the work challenging. The tool was highlighted as a mechanism to aid awareness-raising, because it gave participants something tangible with which to initiate interactions and discussions about the initiatives and share their work more broadly.

It's quite difficult for them to raise their projects or to go and talk to people, just to cold call about the project, but the tool was a vehicle that they could hang a conversation on about their projects. (P3_I27_Programme Lead)

2. **Supporting Decision-Making**

Managing processes, adapting to needs and responding to system changes have been seen as essential to sustaining improvements (Dovers 1996; Fiksel 2007; Dauphinee et al. 2011; Shigayeva and Coker 2015). Having a mechanism to assess and judge sustainability risks and plan actions may aid this process (Johnson et al. 2004; Doyle et al. 2013). The tool supported decision-making by allowing for the *identification of risks and needs* and *providing focus or direction* for improvement efforts.

V. **Identifying Risks and Needs:**

Participants recognised the importance of identifying potential risks to sustainability in order to understand how best to avoid pitfalls. The tool played a key role in identifying such risks and aiding teams to consider how best to address them to mitigate risks throughout initiative journeys. Comments made concerning lack of support from staff and

unrealistic expectations helped teams to understand embedded influences on sustainability.

> *The tool of itself obviously is not a solution for fixing your risks or for avoiding your risks, but…[the tool] helped me to reflect about them. I could plan before the risk happened.* (P3_I28_Project 26)

> *Whilst the organisation emphasizes the need to improve, there is some reluctance amongst some staff to support new initiatives.* (P2_Project H_LTS report 2)

VI. **Providing Direction or Focus:**

The sustainability of improvement initiatives depends on interrelated and wide-ranging factors (Shediac-Rizkallah and Bone 1998; Scheirer 2005; Gruen et al. 2008). The tool was seen as a way of providing focus among team members and strategically planning for risks factors. It provided a structure to account for sustainability and highlighted the importance of maintaining attention to sustainability risks throughout the project.

> *Are you focusing enough on this thing that you always knew you had to do, that maybe you've lost sight of a little bit? I think that's extremely valuable, because it's easy to get caught up in something and forget about other things that are important.* (P1_I1_Project Beta)

3. **Action Planning**

Using the LTST allowed teams to understand where action was considered crucial for the success of the project. Planning actions support the sustainability of initiatives by reshaping behaviours and activities, changing and adapting interventions and reorganising relationships (May and Finch 2009; Finch et al. 2013). The development of such actions also benefits from being informed by multiple stakeholders at

various organisational levels (Persaud 2014). The tool provided a mechanism for teams to: *suggest actions* and *take actions* to increase chances of making a lasting change.

VII. **Suggesting Actions:**

The tool provided a way of collecting team perspectives on where action was needed and what particular actions would be beneficial to the initiative. Participants shared ideas on what actions may be necessary and also suggested potential solutions to problems.

VIII. **Taking Action:**

> *I got ideas from them (LTST comments), because they would say, 'oh, they did something similar at such and such place, and we do this in clinic', and we find it quite successful. So, they'd give me ideas*. (P1_I29_Project 18)

Participants also took particular actions that were shaped by particular suggestions. Such actions included designating tasks and responsibilities fairly to improve work distribution, using teaching to build the project into everyday practice and taking steps to improve patient engagement. These actions were seen as crucial to sustainability, because they allowed teams to proactively respond to challenges and address problems that may hinder the sustainability of the project in future.

> *The comments that were provided to me by my stakeholders, I've used them and responded accordingly, and based my actions from their response … because it's like having a customer. If you don't know what a customer needs you don't know what to provide the customer*. (P3_I32_Project 24)

> *They did action a couple of things in regards to educating other staff. So, they had MDTs (multi-disciplinary teams) where they started to educate the other nurses [who] weren't involved in the project on what they were doing, and also junior doctor turnover. The consultant cardiologist would be teaching them anyways. So, he added in a slot where they'd talk about the bundle (a heart failure care bundle to optimise the care of heart failure patients) and tell them what you need to do*. (P1_I21_Project Delta)

The Role of Structured Tools for Sustainable Improvement

The aim of this chapter was to discern the processes by which improvement teams influence sustainability in improvement initiatives using a structured sustainability tool, the LTST. The contribution of the chapter was to show that structured tools focused specifically on sustainability can aid sustainability by focusing on challenges, and optimising opportunities, for long-term survival as they present during a project's design and implementation. To this extent, such tools also complement participatory action research methods, which, through cycles of action, evaluation, modification and re-implementation, can help ensure that innovations are coherent with the reality of everyday practice in particular contexts. This work explored the role of a sustainability tool in supporting sustainability processes and investigated underlying mechanisms which contributed to these processes.

The LTST was used by 56 diverse improvement teams. We explored the tool's role in negotiating sustainability processes across three QI programmes. Our findings have shown that the LTST supported three high-level sustainability processes with eight mechanisms throughout the initiatives: *collaboration* (*identifying and engaging stakeholders*, *gathering team perspectives, giving people the space to express opinions* and *raising awareness); decision-making* (*identifying risks and needs,* and *providing direction or focus);* and *action planning (suggesting actions* and *taking action)*.

Our findings are supported by other studies in the field which have also shown that overtly fostering collaboration among team members and their wider stakeholders; supporting decision-making by highlighting risks and needs of the initiatives; and prompting action planning to improve chances of sustainability throughout initiative journeys are important processes to sustain changes (Brinkerhoff and Goldsmith 1992; Mancini and Marek 2004; Leffers and Mitchell 2011; May et al. 2011; Scheirer and Dearing 2011; Iwelunmor et al. 2016). While our study corroborates much of the research evidence, we also contribute new empirical findings to the sustainability literature. Our work

has demonstrated that a sustainability tool can play a role in enhancing and supporting sustainability processes in improvement initiatives. Initiative sustainability can be aided by forming networks and building collaboration between diverse stakeholders although fostering this collaboration can be labour-intensive to achieve (Shediac-Rizkallah and Bone 1998; Mancini and Marek 2004; Maher et al. 2010; Leffers and Mitchell 2011; Lennox et al. 2017). Professional and personal boundaries often have to be considered, given that these groups have competing priorities and perspectives (Wenger 1998; Lamont and Molnár 2002).

Bringing together different stakeholders in a QI initiative requires cooperation from all groups to reconcile or make sense of the 'social worlds' held by each (Gerson 1983; Star and Griesemer 1989). The LTST appears to provide a mechanism which supports collaboration by highlighting different perspectives held between team members and providing a forum for sharing diverse opinions. Specifically, the anonymity of the scores was highlighted as providing a safe place for people to voice difficult or controversial views. This becomes increasing important in health care where established hierarchies can discourage critical feedback (Sutcliffe et al. 2004).

Shared decision-making among stakeholders is also an important determinant for the sustainability of complex health programmes (Mancini and Marek 2004). This process often requires improvement teams to address multiple priorities and potentially conflicting agendas (Wheeler 2009). It is, therefore, essential that improvement teams have the ability to identify risks and respond to system needs to sustain changes over time (Dauphinee et al. 2011). Our findings indicate the LTST aided the sustainability process by enhancing knowledge of risks within ongoing initiatives and enabled participants to understand the views and concerns within their teams.

In order to enhance sustainability in practice, improvement teams must take action to respond, adapt and mitigate challenges and risks(Shediac-Rizkallah and Bone 1998; Maher et al. 2010; Lennox et al. 2017). The tool served as a reflective and thought-provoking mechanism connecting key perspectives within teams and directing attention to particular challenges and risks needing attention.

This resulted in specific actions being identified and taken that were directed, as opposed to being relatively random and based on the whims of one stakeholder, for example team members highlighted the reliance of the initiatives on particular staff members and therefore the wider team took action to designate tasks and responsibilities more widely and fairly.

This research provides not only valuable information on the processes involved in sustaining improvements, but also provides insight into how a sustainability tool can foster prospective sustainability planning and actions throughout initiative journeys. The tool enabled the ongoing tacit and collaborative working within teams and across stakeholders to be made visible. The value that the tool added shows the importance of studying sustainability prospectively as an ongoing process throughout initiatives. Prospective sustainability planning can allow those engaged in new initiatives to make connections, maintain focus and mitigate risks to enhance chances of achieving long-term success (Pluye et al. 2004).

Although our study aided in the exploration of prospective sustainability processes, impact on sustainability outcomes remains unknown. The findings suggest that having a tool to study sustainability throughout an initiatives' journey may aid in prospective sustainability actions and planning, but we do not know if this will ultimately increase initiative longevity. Generalisability of study findings is also a limitation. The tool was tested across three QI programmes with diverse initiatives, but it is unknown if similar results would be achieved in other healthcare contexts (i.e. programmes with little or no QI support).

We suggest that our study could support further research in this area by providing a basis for identifying similar or additional sustainability processes in other settings. We are also unsure of the extent to which other sustainability tools will support the identified processes. Further investigation and application of other tools in practice are required to understand if sustainability tools can all perform a general function of supporting sustainability processes. Future research in this field would also benefit from applying available tools to understand the application processes and assess the overall impact of their use (Scheirer and Dearing 2011).

Conclusion

This chapter conveyed how the LTST supported three processes for the sustainability of improvement initiatives. Given the complexity of boundary-work in contemporary health care, the optimal coordination of diverse health professionals and services demands greater insight into sustainability processes. The extent to which these processes occur in individual initiatives and how they impact sustainability outcomes is unknown. Future research should focus on how various stakeholders of a new initiative can adapt their initiatives in real times and places. Future research by the current team will involve a cross-site analysis in which programme-level findings will be examined, with the aim of discerning generalisable learning on challenges and facilitators to sustainability. Ultimately, this study indicates that sustainability tools may be useful to assessing teams' perceptions of sustainability to prompt planning and actions to increase chances of success. Sustainability is a challenging concept to explore but the use of a prospective tool may aid those undertaking improvement initiatives to identify risks and allow for prospective sustainability planning.

References

Altman, D. G., et al. (1991). Obstacles to and future goals of ten comprehensive community health promotion projects. *Journal of Community Health, 16*(6), 299–314. https://doi.org/10.1007/BF01324515.

Bowman, C. C., et al. (2008). Measuring persistence of implementation: QUERI series. *Implementation Science, 3*(21). https://doi.org/10.1186/1748-5908-3-21.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3,* 77–101.

Brinkerhoff, D. W., & Goldsmith, A. A. (1992). Promoting the sustainability of development institutions: A framework for strategy. *World Development, 20*(3), 369–383. https://doi.org/10.1016/0305-750X(92)90030-Y.

Calhoun, A., et al. (2014). Using the program sustainability assessment tool to assess and plan for sustainability. *Preventing Chronic Disease, 11*(Table 1), 130185. https://doi.org/10.5888/pcd11.130185.

Chambers, D. A., Glasgow, R. E., & Stange, K. C. (2013). The dynamic sustainability framework: Addressing the paradox of sustainment amid ongoing change. *Implementation Science: IS, 8*(1), 117. https://doi.org/10.1186/1748-5908-8-117.

Chaudoir, S. R., Dugan, A. G., & Barr, C. H. I. (2013). Measuring factors affecting implementation of health innovations: A systematic review of structural, organizational, provider, patient, and innovation level measures. *Implementation Science: IS, 8*(22), 1–20. https://doi.org/10.1186/1748-5908-8-22.

Curcin, V., et al. (2014). Model-driven approach to data collection and reporting for quality improvement. *Journal of Biomedical Informatics, 52,* 151–162.

Damschroder, L. J., et al. (2009). Fostering implementation of health services research findings into practice: A consolidated framework for advancing implementation science. *Implementation Science: IS, 4,* 50. https://doi.org/10.1186/1748-5908-4-50.

Dauphinee, W. D., et al. (2011). A framework for designing, implementing, and sustaining a national simulation network. *Simulation in Healthcare: Journal of the Society for Simulation in Healthcare, 6*(2), 94–100. https://doi.org/10.1097/SIH.0b013e31820695e8.

Dovers, S. R. (1996). Sustainability: Demands on policy. *Journal of Public Policy, 16*(3), 303–318. https://doi.org/10.1017/S0143814X00007789. Imperial College London Library.

Doyle, C., et al. (2013). Making change last: Applying the NHS institute for innovation and improvement sustainability model to healthcare improvement. *Implementation Science: IS, 8*(1), p. 127. https://doi.org/10.1186/1748-5908-8-127.

Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing, 62*(1), 107–115. https://doi.org/10.1111/j.1365-2648.2007.04569.x.

Feldstein, A. C., & Glasgow, R. E. (2008). A practical, robust implementation for integrating research findings into practice. *The Joint Commission Journal on Quality and Patient Safety, 34*(4), 228–243.

Fiksel, J. (2003). Designing resilient, sustainable systems. *Environmental Science and Technology, 37*(23), 5330–5339. https://doi.org/10.1021/es0344819.

Fiksel, J. (2007). Sustainability and resilience: Toward a systems approach. *IEEE Engineering Management Review, 35*(3), 5. https://doi.org/10.1109/EMR.2007.4296420.

Finch, T. L., et al. (2013). *Improving the normalization of complex interventions* (pp. 1–8). https://doi.org/10.1186/1748-5908-8-43.

Folke, C., et al. (2002). Resilience and sustainable development: Building adaptive capacity in a world of transformations. *Ambio, 31*(5), 437–440. https://doi.org/citeulike-article-id:1524120.

Gerson, E. M. (1983). Scientific work and social worlds. *Knowledge, 4*(3), 357–377. https://doi.org/10.1177/107554708300400302.

Glasgow, R. E., Vogt, T. M., & Boles, S. M. (1999). Evaluating the public health impact of health promotion interventions: The RE-AIM framework. *American Journal of Public Health, 89*(9), 1322–1327.

Goodman, R. M., et al. (1993). Development of level of institutionalization scales for health promotion programs. *Health Education Quarterly, 20*(2), 161–178.

Greenhalgh, T., et al. (2004). *How to spread good ideas: A systematic review of the literature on diffusion, dissemination and sustainability of innovations in health service delivery and organisation*. London.

Gruen, R. L., et al. (2008). Sustainability science: An integrated approach for health-programme planning. *The Lancet, 372*(9649), 1579–1589. https://doi.org/10.1016/S0140-6736(08)61659-1. Elsevier Ltd.

Healthcare Improvement Scotland. (2013, July). Guide on spread and sustainability. *Change and Its Leadership: The Role of Positive Emotions,* 39.

Hovlid, E., et al. (2012). Sustainability of healthcare improvement: What can we learn from learning theory? *BMC Health Services Research, 12,* 235. https://doi.org/10.1186/1472-6963-12-235.

Iwelunmor, J., et al. (2016). Toward the sustainability of health interventions implemented in sub-Saharan Africa: A systematic review and conceptual framework. *Implementation Science: IS, 11*(1), 43. https://doi.org/10.1186/s13012-016-0392-8.

Johnson, K., et al. (2004). Building capacity and sustainable prevention innovations: A sustainability planning model. *Evaluation and Program Planning, 27*(2), 135–149. https://doi.org/10.1016/j.evalprogplan.2004.01.002.

Lamont, M., & Molnár, V. (2002). The study of boundaries in the social sciences. *Annual Review of Sociology, 28*(1), 167–195. https://doi.org/10.1146/annurev.soc.28.110601.141107.

Leffers, J., & Mitchell, E. (2011). Conceptual model for partnership and sustainability in global health. *Public Health Nursing, 21*(1), 91–102. Copyright (C) 2011 Blackwell Publishing Ltd.: Blackwell Publishing Inc.

Lennox, L., et al. (2017). What makes a sustainability tool valuable, practical, and useful in real world healthcare practice? A qualitative study on the development of the long term success tool in Northwest London. *British Medical Journal Open, 7*(e014417), 1–13. https://doi.org/10.1136/bmjopen-2016-014417.

Lennox, L., Maher, L., & Reed, J. (2018). Navigating the sustainability landscape: A systematic review of sustainability approaches in healthcare. *Implementation Science, 13*(1), 1–17. https://doi.org/10.1186/s13012-017-0707-4.

Maher, L., Gustafson, D., & Evans, A. (2010). *Sustainability model and guide*. Coventry, UK: NHS Institute for Innovation and Improvement.

Mancini, J. A., & Marek, L. I. (2004). Sustaining community-based programs for families: Conceptualization and measurement. *Family Relations, 53*(4), 339–347.

Martin, G. P., et al. (2012). Innovation sustainability in challenging health-care contexts: Embedding clinically led change in routine practice. *Health Services Management Research, 25,* 190–199. https://doi.org/10.1177/0951484812474246.

May, C., & Finch, T. (2009). Implementing, embedding, and integrating practices: An outline of normalization process theory. *Sociology, 43*(3), 535–554. https://doi.org/10.1177/0038038509103208.

May, C. R., et al. (2011). Evaluating complex interventions and health technologies using normalization process theory: Development of a simplified approach and web-enabled toolkit. *BMC Health Services Research*. C.R. May, Faculty of Health Sciences, University of Southampton, UK, 11, p. 245.

Moore, J. E., et al. (2017). Developing a comprehensive definition of sustainability. *Implementation Science, 12*(1), 110. https://doi.org/10.1186/s13012-017-0637-1.

NHS Modernisation Agency. (2004). *Complexity of sustaining healthcare improvements: What have we learned so far: Research into Practice report 13*.

Onwuegbuzie, A. J., & Leech, N. L. (2007). Sampling designs in qualitative research: Making the sampling process more public. *The Qualitative Report, 12*(2), 19–20. https://doi.org/10.1007/s11135-006-9000-3.

Persaud, D. (2014). Enhancing learning, innovation, adaptation, and sustainability in health care organizations: The ELIAS performance management framework. *Health Care Manag (Frederick)*. (C) 2014 Wolters Kluwer Health|Lippincott Williams & Wilkins: Author Affiliation: School of Health Administration, Dalhousie University, Halifax, Canada, pp. 183–204.

Plsek, P. E., Wilson, T., & Greenhalgh, T. (2001). Complexity science: The challenge of complexity in health care. *British Medical Journal, 323*(7315), 625–628. https://doi.org/10.1136/bmj.323.7315.746.

Pluye, P., Potvin, L., & Denis, J.-L. (2004). Making public health programs last: Conceptualizing sustainability. *Evaluation and Program Planning, 27*(2), 121–133. https://doi.org/10.1016/j.evalprogplan.2004.01.001.

QSR International Pty Ltd. (2016). *NVivo qualitative data analysis software* (11th ed.). Melbourne, Australia: QSR International Pty Ltd.

Ritchie, J. S. (1994). *Qualitative data analysis for applied policy research* (R.G. Burgess, Ed.). London: Routledge.

Sarriot, E. G., et al. (2004). A methodological approach and framework for sustainability assessment in NGO-implemented primary health care programs. *International Journal of Health Planning and Management, 19,* 23–41.

Savaya, R., Elsworth, G., & Rogers, P. (2009). Projected sustainability of innovative social programs. *Evaluation Review, 33*(2), 189–205. https://doi.org/10.1177/0193841X08322860.

Scheirer, M. A. (2005). Is sustainability possible? A review and commentary on empirical studies of program sustainability. *American Journal of Evaluation, 26*(3), 320–347. https://doi.org/10.1177/1098214005278752.

Scheirer, M. A., & Dearing, J. W. (2011). An agenda for research on the sustainability of public health programs. *American Journal of Public Health, 101*(11), 2059–2067. https://doi.org/10.2105/AJPH.2011.300193.

Schell, S. F., et al. (2013). Public health program capacity for sustainability: A new framework. *Implementation Science, 8*(1), 15. https://doi.org/10.1186/1748-5908-8-15.

Schouten, L. M. T., et al. (2008). Evidence for the impact of quality improvement collaboratives: Systematic review. *BMJ (Clinical Research Ed.), 336*(7659), 1491–1494.

Senge, P., et al. (1999). *The dance of change: The challenges of sustaining momentum in learning organizations*. London: Nicholas Brealey.

Shediac-Rizkallah, M. C., & Bone, L. R. (1998). Planning for the sustainability of community-based health programs: Conceptual frameworks and future directions for research, practice and policy. *Health Education Research, 13*(1), 87–108.

Shigayeva, A., & Coker, R. J. (2015). Communicable disease control programmes and health systems: An analytical approach to sustainability. *Health Policy and Planning, 30*(3), 368–385. https://doi.org/10.1093/heapol/czu005.

Sirkin, H. L., Keenan, P., & Jackson, A. (2005, October). The hard side of change management. *Harvard Business Review, 10,* 109–118.

Star, S. L., & Griesemer, J. R. (1989). Institutional ecology, 'translations' and boundary objects: Amateurs and professionals in Berkeley's Museum of vertebrate zoology, 1907–39. *Social Studies of Science, 19*(3), 387–420. https://doi.org/10.1177/030631289019003001.

Stirman, S. W., et al. (2012). The sustainability of new programs and innovations: A review of the empirical literature and recommendations for future research. *Implementation Science, 7*(1), 17. BioMed Central Ltd. https://doi.org/10.1186/1748-5908-7-17.

Sutcliffe, K. M., Lewton, E., & Rosenthal, M. M. (2004). Communication failures: An Insidious contributor to medical mishaps. *Academic Medicine, 79*(2), 186–194. https://doi.org/10.1097/00001888-200402000-00019.

Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing Health Sciences, 15*(3), 398–405.

Wenger, E. (1998). Communities of practice: Learning as a social system. *Systems Thinker, 9*(5), 2–3. https://doi.org/10.2277/0521663636.

Wheeler, S. (2009). Using research. *Business Information Review, 26*(2), 112–120. https://doi.org/10.1177/0266382109104412.

WHO. (2004). *Guidelines for Conducting an Evaluation of the Sustainability of CDTI Projects*, *African Programme for Onchocerciasis Control*.

Wiek, A., et al. (2012). From complex systems analysis to transformational change: A comparative appraisal of sustainability science projects. *Sustainability Science, 7*(Suppl. 1), 5–24. https://doi.org/10.1007/s11625-011-0148-y.

Williams, L., et al. (2015, August). A cluster-randomised quality improvement study to improve two inpatient stroke quality indicators. *BMJ Quality & Safety, 25*(4), 257–264. https://doi.org/10.1136/bmjqs-2015-004188.