Evaluation of the Scottish Patient Safety Programme sepsis VTE collaborative: Short Report

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Summary

The collaborative is an increasingly popular approach to improvement in healthcare. The most widely used model is the Institute for Healthcare Improvement's (IHI) 'Breakthrough Series collaborative' (BTS) model,[1] in which a community of practitioners use continuous quality improvement methods to achieve improvement towards specific aims, supported by a core of expert faculty. There is evidence that collaboratives can be effective as an approach to improvement, but their effectiveness is likely to be partly dependent on their particular organisation and structure, and the programme context. Although some consensus has been reached about the factors that influence the success of a collaborative approach, a lack of empirical evidence persists about how the approach can be optimised.

We report a summary of findings from a qualitative evaluation of the Scottish Patient Safety Programme (SPSP) sepsis VTE collaborative. The evaluation involved:

- ethnographic research in six participating sites comprising ~300 hours of observation and 46 staff interviews;

- two rounds of telephone interviews with six stakeholders and 19 members of local teams participating in the collaborative;

- observations of programme activities;

- and document analysis.

We have identified 10 key lessons for future use of the collaborative approach, organised around four main themes:

- planning;

- building will;

- sharing ideas;

- and executing improvement.

Theme 1: Planning

Lesson 1: Make an active decision about whether a BTS-style collaborative programme is the best approach for the problem in hand

Give careful consideration to decisions about whether to use this model as opposed to other improvement approaches (e.g. campaigns or frameworks of incentives), particularly given the resources required to implement a collaborative programme.

Lesson 2: Invest time and resources in planning and building infrastructure, and be flexible in delivery

Start with a structured project plan, but be prepared to adapt the approach to respond to participants' needs. Invest in building and resourcing a high-quality faculty team. Design collaborative activities with explicit consideration of their purpose and objectives.

Theme 2: Building will

Lesson 3: Involve committed, credible, and engaging national clinical leads
Involve individuals who can build a social movement around the improvement effort and who are resourced to invest time and effort in engaging with sites.

Lesson 4: Use multiple levers to gain engagement and maintain momentum
Establish clear and consensual objectives and improvement aims. Use diverse strategies to promote engagement and build will and motivation.

Lesson 5: Celebrate improvement efforts and create a culture of openness about failure
Recognise, celebrate, and learn from improvement efforts, whether successful or not. Use role-modelling and encouragement to shift norms around learning from failure and to set expectations about what can be achieved.

Theme 3: Sharing ideas for improvement

Lesson 6: Explain the evidence base for interventions; be clear about what aspects should be standardised and what can be adapted
Use driver diagrams and change packages to explain the mechanisms of change used in interventions. The balance between standardisation and local adaptation of interventions needs careful management, with explicit guidance to participants.

Lesson 7: Maximise opportunities for the community to share ideas and learn from each other
Design programme events to facilitate sharing of ideas and learning. Maximise opportunities for local teams to spend time working together as well as sharing experiences with others. Support participants in building horizontal links with other sites to facilitate shared learning. Consider how the collaborative can take an active role in rapidly disseminating new knowledge and learning.

Theme 4: Supporting execution

Lesson 8: Prepare teams to do improvement back home: Leadership and QI skills
Local clinical leadership is critical for achieving local improvement. Make explicit the role and expectations of the local clinical lead, and support local clinical leads to develop their skills. Teams may need basic quality improvement (QI) training to equip them to achieve improvement 'back home'.

Lesson 9: Measure well and promote the active use of data for improvement on the ground
Invest in efforts to maximise the likelihood that data collected will be high quality and to minimise the burden of data collection. Encourage participating sites to invest in setting up sustainable local data collection and reporting systems, and to use data actively for improvement.

Lesson 10: Secure organisational commitment to improvement as a long term investment
Senior support at board level has an important role to play in raising the profile of the improvement work locally and embedding it in organisational priorities and activities, and enabling local teams to access the resources and support they need to do improvement work.

Introduction

The Scottish Patient Safety Programme (SPSP) sepsis VTE collaborative

The SPSP sepsis VTE collaborative ran from January 2012 to December 2014 as part of the Scottish Patient Safety Programme. The collaborative brought together teams from all 14 regional NHS boards across Scotland, along with the National Waiting Times Centre and the Scottish Ambulance Service, to enable boards to work together to improve the reliability of the delivery of evidence-based interventions related to sepsis and venous thromboembolism (VTE). The overall aims of the programme were to optimise patient care, and reduce harm and mortality. Local teams were tasked with implementing sustainable improvement in pilot wards, then initiating the wider spread of improvement.
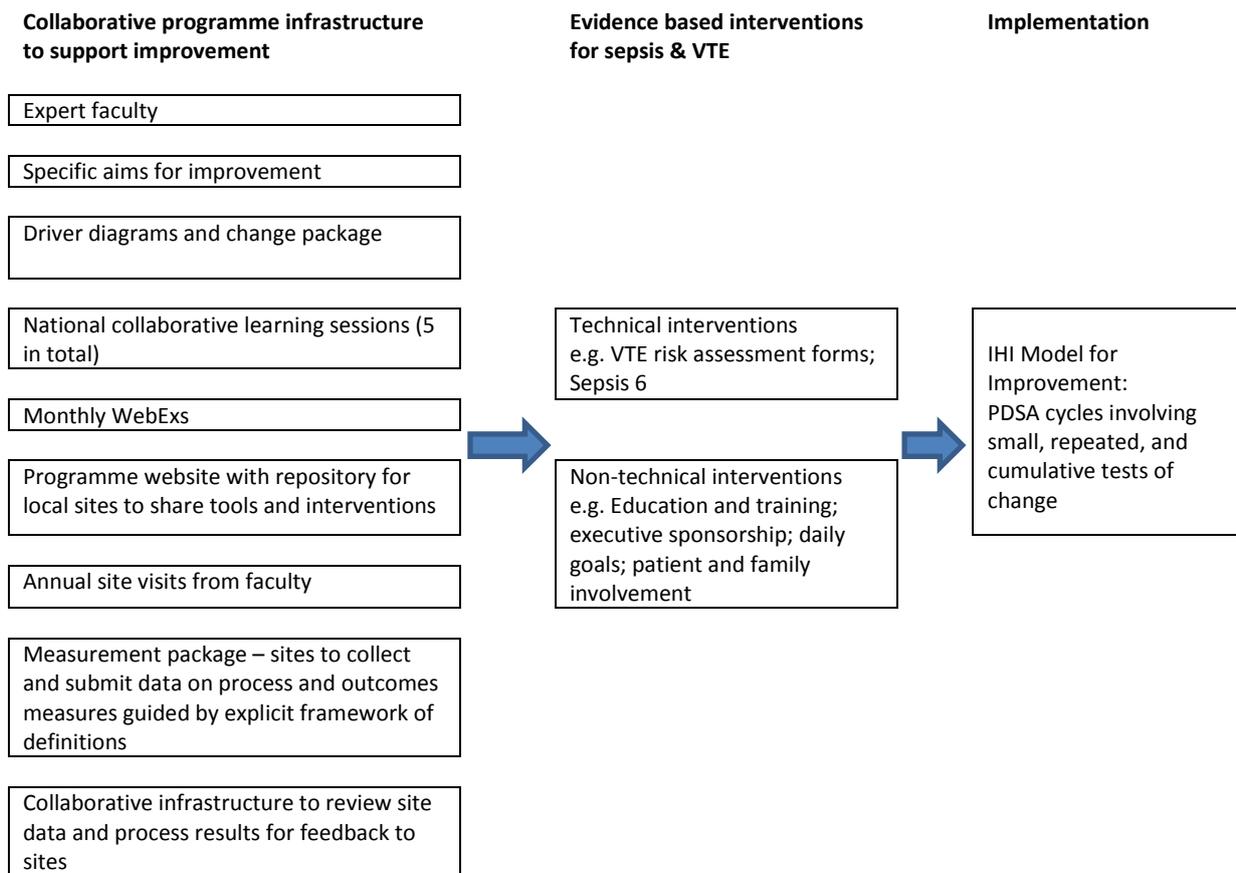
The collaborative model is an increasingly popular and widely used approach towards improvement in healthcare, and offers a different type of approach to that used in improvement campaigns. Campaigns focus primarily on awareness-raising and dissemination of good practice (often with elements of measurement at local or national levels), whereas collaboratives primarily aim to bring together a community of practitioners to work together on implementing good practice and sharing learning about how to achieve this. A quality improvement collaborative has a number of fundamental features: an agreed topic and aim; a core faculty comprising clinical and quality improvement experts; the involvement of multi-professional teams from different sites; the use of a model for improvement; the organisation of activities including learning meetings; and the use of data for improvement. The model supports participants in developing QI skills, and helps generate enthusiasm, motivate action, and support sharing of learning.[2-4]

The SPSP Sepsis VTE collaborative was based on the Institute for Healthcare Improvement's (IHI) 'Breakthrough Series collaborative' (BTS) model.[1] Specifically orientated towards healthcare contexts, and underpinned by the IHI Model for Improvement, it poses three questions:

- What are we trying to accomplish?;

- How will we know any change is an improvement?;

- What changes can we make that will result in improvement?

The BTS approach seeks to foster a community of practitioners mobilised around specific and measurable aims, who use the IHI model for improvement and plan-do-study-act (PDSA) cycles, to achieve improvement. BTS collaboratives are characteristically coordinated by a central faculty of subject matter and improvement experts supported by a project team. Improvement is supported through regular facilitated learning sessions that bring the community together, and provide a setting for formal training and sharing of learning; web discussions and site visits from faculty are also conducted. Participants collect and share data regarding progress made on a common set of process and/or outcome measures tied to the specific aims of the collaborative. See Figure 1 for a summary of the design of the SPSP Sepsis VTE Collaborative.

Figure 1: Design of the SPSP Sepsis VTE Collaborative

Collaborative programme infrastructure to support improvement	Evidence based interventions for sepsis & VTE	Implementation

Expert faculty

Specific aims for improvement

Driver diagrams and change package

National collaborative learning sessions (5 in total)

Monthly WebExs

Programme website with repository for local sites to share tools and interventions

Annual site visits from faculty

Measurement package – sites to collect and submit data on process and outcomes measures guided by explicit framework of definitions

Collaborative infrastructure to review site data and process results for feedback to sites

Technical interventions e.g. VTE risk assessment forms; Sepsis 6

Non-technical interventions e.g. Education and training; executive sponsorship; daily goals; patient and family involvement

IHI Model for Improvement: PDSA cycles involving small, repeated, and cumulative tests of change

Effectiveness of collaboratives

Evidence for the effectiveness of collaboratives as an approach to improvement in healthcare is positive but limited.[5] Collaboratives vary extensively in their aims and in the way they are organised and delivered; this is likely to in part explain the lack of consistent findings on their impact. A recent research scan suggested a complex picture of the relationship between features of collaboratives and their success. The scan identified a range of factors that may impact effectiveness: the nature of who is involved in the collaborative; the types of setting; the specifics of how the collaborative is delivered; and the content (particularly the topic, the approach to measurement, and sustainability).[6]

Ovretveit et al[7] set out ten recommendations about running an effective collaborative, based on learning from workshops with experts in improvement:

Preparation and defining purpose:
1. Choose the right type of subject.
2. Define objectives for taking part and assess your capacity to benefit from the collaborative.
3. Define roles and make clear what is expected.
4. Ensure team building and preparation by teams for the collaborative.

Recommendations for collaborative learning meetings:
5. Emphasise mutual learning rather than teaching.
6. Pay attention to motivating and empowering teams.
7. Ensure teams have measurable and achievable targets.
8. Equip and support teams to deal with data and change challenges.

Recommendations for post-collaborative transition

9. Learn and plan for sustaining improvements, involving managers in this work.
10. Plan and learn for "spread".

Rationale: studying a collaborative in action

While some consensus has been reached about the factors that influence the success of a collaborative approach, there remains a lack of empirical evidence on which factors are decisive in optimising the use of the approach.[8,9] There have been calls for more research to look inside the 'black box' of improvement collaboratives: to explore how collaborative approaches function in practice, the effectiveness of different components of the collaborative approach, and the factors that impact on success or failure in different contexts.[5,6,10]

The SPSP Sepsis VTE collaborative provides an opportunity to study a collaborative in action. It is a particularly interesting case study in that it targets two distinct topics for improvement using the same improvement methodology and within the same or similar settings in participating sites.

Evaluation aims:

- Identify the key components and activities involved in the Sepsis / VTE collaborative, describing the extent to which these were delivered or took place successfully, and participants' experiences of the collaborative activities;

- Describe the impact of the collaborative programme for sepsis and VTE in generating will and ideas for improvement, and supporting execution

- Describe local responses to the collaborative programme relating to its successes and challenges in achieving sustainable change in management of patients at risk of sepsis and VTE;

- Generate generalisable learning to optimise the design of future projects which draw on the collaborative approach.

Evaluation methods

The evaluation used ethnographic methods to uncover the mechanisms through which the programme worked to drive improvement, and to explore its impact on the ground.

Researchers conducted observations of programme training events, site visits, and WebExs, and collected programme documentation, over a two year period of collaborative activity. Alongside this, interviews were conducted with six programme stakeholders (individuals with roles in the collaborative faculty, or in patient safety at a national level), and 19 staff from local project teams, at two time points during the collaborative programme. This data was used to generate a programme theory[11] of how the collaborative worked, and what contributed to its effectiveness.

Observations and interviews were also conducted in a purposive sample of hospital sites to explore the impact of the collaborative programme 'on the ground'. A researcher visited six participating hospital sites across five different regional NHS boards in Scotland, each for a period of up to five days, in spring 2013. Return visits were undertaken to three of these sites in spring 2014. Around 300 hours of observations and 46 interviews were conducted.

Findings

Impact of the collaborative: how well did it work?

Our analysis of data from the evaluation identifies four particular sets of activities that seemed fundamental to the way in which the collaborative was meant to work:

- providing focus and resources;

- building will and momentum;

- setting up collaborative activities between sites and with the collaborative faculty;

- and the use of national data for improvement.

Providing focus and resources

The collaborative was effective in providing clear objectives around which participants could mobilise, and equipping participants to lead change by providing interventions and training on improvement. Teams were provided with driver diagrams detailing the issues that needed to be tackled to improve reliability of care. They were also provided with bundles of evidence-based 'technical' interventions and a measurement plan for both sepsis and VTE. Improvement was premised on principles of local ownership and adaptation and empowering multi-disciplinary teams to make changes themselves in their own hospitals.

It's about trying to ensure that first that the teams know what they need to do, what the objectives are, so set the objectives, then set how we're going to achieve those objectives and what are the, kind of, tools going to be available to the teams to be able to achieve those objectives. (Stakeholder)

Building will and momentum

The collaborative activities were highly effective in building will and raising the profile of the topics, particularly in the case of sepsis. Strategies that were particularly effective included the use of patient stories, the involvement of important speakers, and the endorsement of the programme by high profile individuals.

There was a lady who basically spoke about how her husband had died and the sequence of events. […] The patient perspective was really good. (Participant)

Usually you have motivational speakers […] you think coming away 'right, well, we need to do better'. (Participant)

The expertise and skills of the faculty, and the personalities and commitment of the national clinical leads, were also seen as key by participants and stakeholders alike. Participants felt that working as part of a national collaborative with explicit timeframes and deadlines helped maintain momentum. Being part of a national collaborative gave focus and legitimacy to teams' improvement work, and provided recognition for local efforts. Stakeholders recognised that the activities of the collaborative provided opportunities for demonstrating that success was achievable, for creating a culture of openness about failure, and for generating normative pressure for improvement. The learning sessions were used as opportunities for senior leaders to present accounts of their own failures and their learning, and participants were encouraged to share their failures with others.

A bit of learning for all of us [was] about helping people that are coming from boards to understand that we don't just want a good news story […] please tell us where you've failed so we can learn from it. (Stakeholder)

Local executive support was critical for helping to maintain momentum, and could help overcome problems, particularly those which required additional resources.

Collaborative activities: Learning sessions, WebExs, website and site visits

The collaborative provided multiple routes for sharing learning, the most effective of which seemed to be providing time for interactions between teams from different boards at learning sessions. Participants highly valued learning from others' successes and having an opportunity to discuss challenges. They also valued access to expert faculty at learning sessions.

It's just a good opportunity to see how other boards are dealing with VTE and, you know we, we took the idea for our risk assessment sticker from one of these events. (Participant)

Participants also felt the learning sessions were useful in that they enabled those involved in the sepsis or VTE work within the board to get together, away from the demands of clinical duties, and take time to discuss progress and plan for future activities.

The group work that we have done at the sessions, the break-out sessions and the board planning sessions. We talk about what we have seen at the session, what we can take back and what we can do straight away when we get back. They are useful. (Participant)

WebExs proved useful for sharing learning, providing similar benefits to the learning sessions. The advantages of WebExs included that they occurred more regularly, were more accessible, and did not require staff to take days out of work. They were seen as a particularly important resource for teams from sites that were more geographically isolated. Not all participants, however, felt that WebExs worked for them.

Similarly, some participants engaged with the website and used it as a means of accessing tools and techniques that had worked for other sites, but others did not. While more convenient, the mediated nature of IT-based learning and sharing opportunities meant that they were not always as effective as face-to-face forums.

Participants described ambiguity around the purpose of site visits. They could be effective in raising the profile of local collaborative work, provide an opportunity for celebration, and act to re-enthuse and motivate people. But they were also sometimes seen as a means through which the faculty held site teams to account for their progress, potentially creating tension with other purposes – for example, inhibiting frankness in discussing problems and deciding how they might be remedied.

National data for improvement

Project teams that had engaged fully with collecting and using local data were very positive about the national collaborative dataset. Staff found data useful for providing evidence of improvement, and indeed as reassurance that improvement was taking place. This evidence was sometimes publicised more widely to maintain awareness and momentum.

The data has definitely really helped. It is the assurance that we know we have made a sustained improvement. The data has been telling us that. (Participant)

Challenges and areas for improvement: running a collaborative

While, as discussed below, the success of the collaborative approach differed between the two chosen topics of sepsis and VTE, some general lessons can be learned from the SPSP sepsis VTE collaborative about the practicalities of running an effective collaborative. This includes the need to:

- incorporate reflection and flexibility into project planning;

- include training on QI and implementation approaches;

- encourage and support more active use of data;

- make explicit the role of clinical leaders in driving local change.

Stakeholders emphasised the importance of planning and good project management for a successful collaborative. Importantly, faculty members felt there would be value for future collaboratives in explicitly building time-points into the programme plan to review and reflect on progress and lessons learned to date, consult with stakeholders, and revise plans for the next time period.

Maybe that's a piece [of advice] actually for collaboratives in general, having some sort of process whereby it's part of the function that you stop and take stock and review it. […] So some sort of forcing function to review progress, lessons learned, what we're going to change for next year. (Stakeholder)

The programme was premised on participating staff having (or being able to access) QI skills and knowledge. Stakeholders felt that this was sometimes limited, and sites would have benefitted from more support and training in basic QI methods and implementation science.

In the early days we did a little bit of QI training in terms of the model for improvement […] We've done a bit of that, I probably would have liked to have done more. (Stakeholder)

The IHI Model for Improvement, involving the use of PDSA cycles as the primary improvement method, proved effective for bounded problems and for implementing interventions which were within the scope of control of project teams. However sites struggled when they faced less tractable problems relating to systems or resource issues, or problems that cut across boundaries within the organisation; a finding that mirrors other research into collboratives.[4] This was particularly the case for VTE reassessment, where the timescale and the fact that patients were moving out of the pilot ward made small tests of change problematic.

48 hours reassessment, which of course nobody stays, very few patients stay in our area for 48 hours. So 48 hours reassessment we haven't touched that. (Participant)

And things like reassessments with VTE, that doesn't lend itself […] to small scale testing.[…] If you're doing something like VTE where you're looking at 48 or 72 hours reassessment, patients move around the system too much to actually test that in any sort of meaningful way in a single ward. (Stakeholder)

Evidence suggested that active use of data to drive improvement at the frontline was critical, but not all boards succeeded in this. Many participants felt unable to collect high quality data due to local constraints, suggesting there should be more central involvement in collecting and reporting data, and more investment of local resources in, and support for, data collection and reporting.

It has been hard to do [data collection] and I don't think we are doing it accurately. […] I don't think the figures that we have been generating are necessarily a true reflection of what is happening. (Participant)

Furthermore, stakeholders felt there could be clearer messages from the collaborative about why and how to use data effectively for improvement.

Stakeholders felt that the role of local clinical leads was critical in driving improvement locally, and reflected that future collaboratives should focus on the leadership and project management roles. They felt that effective local clinical leadership had been a critical factor for sites that had enjoyed significant successes in their improvement efforts, and a key element of this leadership role was gaining and maintaining staff engagement.

I think leadership; I think clinician engagement; the priorities of workforce […] you know, I did have people say that we don't have time to do this at the moment. (Stakeholder)

There was felt to be value in making more effort to make explicit the nature of effective leadership for improvement, specifically, that this requires engagement and relationship skills, and facilitating the contribution of others.[12] Tasks involved in effectively leading local improvement include:

- championing the topic and the interventions;

- working to gain staff engagement;

- day-to-day work around modelling good practice;

- ongoing awareness raising e.g. through daily safety briefs;

- using data actively to drive practice;

- and leading local education and staff induction.

Impact on promoting improvements in practice for sepsis and VTE

Impact on sepsis detection and response

Ethnographic observations of improvement efforts in relation to sepsis indicated evidence of good uptake and sustainability of sepsis interventions. Frontline engagement and motivation for the sepsis work were generally high across the sites. Project teams generally did not find it too hard to persuade their colleagues that sepsis was an important condition, to gain consensus around efforts to improve care, and to raise awareness of sepsis and bundled best practice (Sepsis 6).[13]

Across the sites systems of screening for sepsis were implemented, and there was an increased focus on achieving the Sepsis 6 within an hour. Effective use was made of posters, apps, and stickers to remind staff about sepsis and the Sepsis 6. There was a lot of informal education, and more formal training, to raise awareness of sepsis and train staff to deliver appropriate interventions, as well as use of innovative motivational strategies—for example, competitions for time to first antibiotic (though these could have some unintended negative consequences).

Key challenges in improving care around sepsis related to:

- lack of buy-in in some areas (particularly emergency departments) to the use of Early Warning Scores (EWS) to screen for sepsis, with the substitution of Systemic inflammatory response syndrome (SIRS) screening as a first-line approach;

- lack of confidence among junior doctors to initiate the Sepsis 6;

- the complexity of processes involved in achieving the Sepsis 6 in practice;

- and the availability of staff to respond to septic patients.

Impact on VTE risk assessment, prophylaxis, and reassessment

Key findings from ethnographic study of improvement work around VTE indicated that staff engagement was more challenging than with sepsis. Work to improve documentation around VTE risk assessment and prophylaxis had progressed well in some sites, and the introduction of pre-printed prophylaxis into prescription forms was seen as an important step towards improving reliability.

Getting staff to engage with VTE tools as part of clinical care, however, was often difficult, partly because of widely-held perceptions about the legitimacy and value of 'doing paperwork', but also because of extensive documentation and time pressures at admission. Well-structured and well-managed accountability mechanisms for VTE assessment and reassessment, and the active use of data, were critical to improving reliability. Achieving reliable reassessment proved challenging.

Comparing collaborative impact across the two topics: sepsis versus VTE

Overall, the BTS collaborative programme approach seemed less effective in driving change in VTE compared with sepsis. The reasons for this were complex (see box 2). The drivers for work on VTE, features of the clinical condition itself, and the proposed solutions, made it more difficult to gain staff engagement and motivation both at the level of project teams, and at the level of staff 'on the ground'.

A factor that was felt to have impacted negatively on the success of the collaborative approach for VTE was the lack of fit between the chosen approach to improvement (the IHI model for improvement and PDSA cycles) and the nature of VTE interventions. This was particularly the case for reassessment, where the timescale and the fact that patients were moving out of the pilot ward made small tests of change problematic. Further, tackling this hospital-wide issue fell outside of the scope of control of local clinical teams. Stakeholders emphasised the need to give careful consideration to the question of when to use a BTS-style collaborative approach, and when other approaches to improvement might be more effective.

BOX 2: Reasons that the collaborative approach was less impactful for VTE (than for sepsis)

- VTE imposed as a 'top down' initiative with a lack of a drive from the clinical community;
- lower national and international profile of VTE (e.g. a lack of campaigns such as World Sepsis Day);
- a lack of evidence of the scale of harm from VTE, less availability of powerful patient stories;
- a lack of belief that the problem was rooted in failing to assess and take preventative action in non-surgical patients in hospital;
- lack of a good evidence base (or belief in the evidence base) for interventions;
- interventions primarily process based, involving documentation and prevention, and seen as less high profile and important work;
- VTE outcomes decoupled from clinical actions on the ground;
- lack of an outcome measure for VTE;
- some VTE interventions, particularly around reassessment, were less amenable to small-scale testing (e.g. via PDSA cycles);
- some of the changes required for improvement were outside the scope of control of the local project team

Lessons learned: Ten lessons for effective quality improvement collaboratives

Drawing on the findings from the evaluation of the SPSP sepsis VTE collaborative, we provide an empirically-based set of recommendations about optimising the use of a collaborative for quality improvement. These lessons extend on existing recommendations on running a collaborative. [6,7] Recommendations fall under four themes: planning; building will; sharing ideas; and executing improvement.

Theme 1: Planning

Lesson 1: Make an active decision about whether a BTS-style collaborative programme is the best approach for the problem in hand

A BTS-style collaborative model is not a 'one size fits all' solution to every quality improvement problem. Give careful consideration to decisions about whether to use this model, particularly given the resources required to implement a collaborative programme.

BTS-style collaboratives are more likely to be appropriate where:

- there is already an interest and appetite for improvement within the clinical community (frontline staff);

- the problems, and corresponding solutions, are bounded and within the scope of local project teams; and

- outcomes can be easily measured, or are there are direct and visible links between clinical actions and outcomes.

In particular the BTS approach is likely to be a good fit for focused clinical problems, with bundled interventions involving clinical care.

BTS-style collaboratives may be less appropriate when a combination of the following apply:

- there is a lack of 'groundswell' or clinical will to tackle the topic;

- the scale of harm, and the roots of the problem, are difficult to demonstrate;

- there is a lack of a convincing evidence-base for the proposed interventions;

- the ability to make a direct link between processes and outcomes is limited (e.g. if outcomes are decoupled from clinical actions, or meaningful outcome measures are lacking);

- the improvement topic is not an organisational priority;

- the volume of activity is small;

- interventions are not amenable to small scale tests of change; or

- problems involve larger-scale issues around systems, teams, staffing, or workflow problems, and/or solutions are non-clinical or go beyond the scope of control of project teams.

Decisions about whether to use a BTS-style collaborative approach should be informed by consideration of the above factors, and there may be value in establishing views of key audiences

regarding whether the problem is seen to be important, where ownership of the problem is perceived to lie, and whether the evidence supporting interventions is generally accepted and felt to be sufficient basis for action.[14] In deciding whether a collaborative approach is likely to be the optimal approach for a given problem consideration should also be given to alternative approaches for driving improvement, including awareness-raising campaigns or frameworks of incentives to motivate change.

Collaboration in quality improvement has many benefits, particularly in situations when bringing together people from across disciplinary boundaries is critical for coming up with workable solutions and providing insight into how to implement them. Given the focus of the BTS style improvement methodology on the use of PDSA cycles, in some cases it may be more appropriate to use a different QI methodology within a collaborative, or to introduce participants to a menu of various QI methodologies and approaches which they can tailor to address the types of problems they are facing in their local context. For example, lean methodologies or systems-based approaches may be more appropriate for certain types of problems.[15]

Lesson 2: Invest time and resources in planning and building infrastructure, and be flexible in delivery

Invest time in creating a structured project plan for the collaborative programme at the start, and do not underestimate the resources, time, and high-level organisational skills needed to ensure the programme runs smoothly. Efforts to adapt and improve the delivery of the programme in response to participants' feedback and needs are critical. Include points in the programme timeframe for taking stock, gaining feedback from participants, and adjusting the approach to meet the needs of participants.

Invest in building a high-quality faculty team, comprising credible experts in the clinical area, and individuals with improvement science, organisation, management, facilitation, and communications expertise. Hold events at good quality venues if possible, provide good refreshments, and ensure events are purposeful, well organised, and run to time. This shows respect for the participating teams' time and effort, and emphasises the importance of the work they are involved in.

Design collaborative activities (such as learning sessions, WebExs, and site visits) with explicit consideration of their purpose and objectives. For example, in the case of site visits, purposes could include:

- providing an opportunity for local teams to showcase their work to faculty and senior members of the board;

- giving local teams time to discuss challenges with faculty and gain advice from faculty;

- enabling faculty to monitor site progress and hold people to account for local progress;

 or some combination of these.

The purpose of activities should also be shared explicitly with participating teams to enable them to engage effectively and get the most out of activities, and to avoid anxieties and misunderstanding. In the specific case of site visits, tensions can be anticipated and managed by faculty clarifying the

intended purposes of site visits at the outset, discussing expectations with sites, and reviewing the functions and purposes of visits with sites as the programme progresses.

Theme 2: Building will

Lesson 3: Involve committed, credible, and engaging national clinical leads
Recognise the critical role of the national clinical leads in acting as figureheads for the programme, campaigning for their given topic, and building a social movement around the improvement effort. This requires clinical leads who are prominent, credible, inspirational, and enthusiastic. Clinical leads should be supported and resourced to invest time in the programme – to engage with sites and to be fully involved in programme activities – as this is likely to have a significant impact on the engagement of project teams at site level.

Lesson 4: Use multiple levers to gain engagement and maintain momentum
Establish clear and consensual objectives around which participants can mobilise, and return repeatedly to these objectives. Establish viable and consensual aims for improvement and review and share progress as measured against these aims.

Use diverse strategies to promote engagement and build will and motivation. Patient stories – stories from patients themselves and clinician stories of patients they have treated – are a powerful tool to gain engagement; stories are particularly effective when coupled with hard data about the scale of the problem and the impact of proposed solutions. Endorsement by high-profile organisations and individuals (particularly if they are able to attend learning sessions in person) lends credibility and sends signals about the importance of the work. This could include people in senior government positions, members of royal colleges, prominent academic clinicians, or high-profile patient representatives. Linking with national or international initiatives (e.g. world sepsis day), and sharing current news or events as 'burning platforms', can also help build will and maintain momentum.

Lesson 5: Celebrate improvement efforts and create a culture of openness about failure
Use learning sessions and WebExs to recognise and celebrate improvement efforts and learning, not just success. Use role-modelling and explicit encouragement to shift norms around being open and learning from failure, and to set expectations about what can be achieved. This might include national clinical leads describing their own failures and poor practice, working to dispel beliefs that boards should present a 'good face' of their work at learning events, and inviting representatives of boards who have previously worked on the topic in question to share their experiences of failures and successes.

Theme 3: Sharing ideas for improvement

Lesson 6: Explain the evidence base for interventions; be clear about what aspects should be standardised and what can be adapted
The collaborative model provides an opportunity to introduce evidence-based interventions at scale. Provide evidence-based interventions for universal implementation where these exist, and explain the mechanisms of change, for example, through generating and sharing driver diagrams and change packages.

While local ownership, generation, and adaptation of solutions are important, there can be a risk of sites diverging from implementing core, evidence based interventions, or selecting inappropriate or ineffective solutions. The balance between standardisation and local adaptation of interventions needs careful management, with explicit guidance to sites as to what constitutes the essential core of interventions and needs to be adopted universally, and what can be adapted. Furthermore, support sites to make sure that new, locally designed interventions are based on theory and evidence.

Lesson 7: Maximise opportunities for the community to share ideas and learn from each other

Capitalise on the major feature of a collaborative approach; the opportunities it presents to foster a socialised approach to learning, and to facilitate sharing of ideas and learning.

Design collaborative events and activities to maximise the opportunities for teams to learn from each other. Presentations or posters by participants about their work at learning sessions or WebExs with facilitated discussion can promote sharing of learning, but more interactive approaches can be particularly productive. 'World café' sessions[16] are an effective way of structuring interactions between sites and facilitating sharing of learning. Consider how to structure events and activities to enable informal social interactions and discussion, which contribute towards building a sense of community (for example, as suggested in other work on optimising the collaborative approach, holding events over more than one day to enable informal social events to be included).[17]

In tandem with efforts to maximise the opportunities for shared learning, there is also a need to recognise that participants' ability and readiness to engage in shared learning will increase as the collaborative programme progresses. As participants gain experience of success and failures in their local work, they are more able to take a lead in identifying their own needs and sharing their learning with others. Tailor learning sessions and other activities to reflect this shift, with increasing focus on shared learning.

Shared learning is valuable not only between teams or sites, but also within teams, members of which often have little time to interact in the course of daily work. Local teams value having time away from work together at learning events to build relationships within the team, to establish lines of communication, and to reflect, share local learning, and plan for the future. Ensure that consideration is given to providing time for this.

Collaborative programmes also provide the opportunity for building horizontal links between sites to facilitate shared learning outside programme-wide events. The establishment of these links can be supported through setting up local buddying systems, or considering activities such as reciprocal peer review between sites or wards. Horizontal links work best when they are not one sided – i.e. not pairing successful sites with struggling sites, but making pairings where each party can learn from the other – and are local, to facilitate face to face meetings and visits.[18]

Faculty members, who form the collaborative core, can play an important role in supporting the sharing of ideas and experiences through systematically collecting, cataloguing, and disseminating examples of learning from failure and of successful interventions. Creating a repository of tools, techniques, and descriptions of local improvement work and lessons learned (for example, on a central website) can help with shared learning. Consideration should also be given, however, as to

how faculty could take a more active role in rapidly disseminating new knowledge and learning without relying so much on the actions and engagement of participating teams: for example, by seeking out good practice and proactively disseminating this out to the community.

Theme 4: Supporting execution

Lesson 8: Prepare teams to do improvement: Leadership and QI skills

Local clinical leadership is critical for achieving local improvement. Specifically, this role includes championing the topic and the interventions at local sites, working to gain local staff engagement, day-to-day work around modelling good practice, engaging in ongoing awareness raising e.g. through daily safety briefs, working collaboratively with others in the multidisciplinary improvement team, using data actively at the frontline to drive practice, holding people to account for failures or poor practice, and leading local education and staff induction. Collaborative training should make explicit the role and expectations of the clinical lead, and support clinical leads to develop their skills in these important areas.

Local teams are tasked with doing the improvement 'back home' at their own workplaces. It cannot be assumed that participants have (or will have access to to) QI knowledge and expertise to lead improvement work; basic QI training may be required to equip staff to achieve improvement.

Lesson 9: Measure well and promote the active use of data for improvement on the ground

The ability to measure progress and to generate comparative data across the programme plays an important role in providing evidence of success, but also in motivating improvement. Invest in efforts to maximise the likelihood that data collected will be high quality, and to minimise the burden of data collection. Good measurement requires pre-programme work in consultation with individuals who have insight into the practicalities of collecting and reporting data from the frontline, in order to establish process and outcome measures. Ensure measurement is underpinned by a well-specified measurement framework with clear definitions, and share this with participants.

Establish an infrastructure as part of the collaborative core to support the collection and sharing of data produced by participating sites, and ensure this is well-resourced. This involves investing in both the technology to enable sites to easily report data centrally to the programme and to ensure their own results and comparative data can be produced in an accessible format, and the personnel to manage the systems, prompt data submission, and process data. Feed back data to sites in an accessible and easy to use form, and encourage local use of data.

Encourage participating sites to set up local systems for data collection and reporting, and for reviewing and acting on findings from the data, at the outset. This may require investment in local resources (such as allocating dedicated staff time to collecting programme data), and gaining buy-in from local data teams and frontline staff. Ensure local project team members are equipped with the knowledge and skills to collect good quality data (perhaps by signposting resources that are available to support local teams in understanding how to measure for improvement).[19,20]

Data generated by sites as part of the collaborative programme has an important role to play in driving improvement 'back home' at local sites. This requires the data to be used actively by sites. Simply displaying data (e.g. on posters on ward notice boards) is not in itself particularly effective.

Instead, data should be reviewed by local leads to gauge progress and to identify areas or issues to target for improvement, actively fed back to staff with explanations about performance levels and what they signify, accompanied by congratulations or encouragement, and used to set and review targets. The value of using data actively for improvement, and how to do this well, needs to be communicated strongly to participating teams.

Lesson 10: Secure organisational commitment to improvement as a long term investment

Gaining executive buy-in and support from the start of the programme is critical. Senior support at the local level has an important role to play in raising the profile of the improvement work locally and embedding it in organisational priorities and activities. It also provides a lever for collaborative faculty to hold sites to account, and importantly, enables local teams to access the resources and support they need to do programme work.

Improvement work takes time; achieving change, embedding interventions, and demonstrating sustained improvement is likely to take a number of years. It is necessary for senior staff in organisations to accept this and commit to long term organisational engagement and support. Encouraging organisations to find ways of resourcing staff time at the frontline to do ongoing improvement work (not just time-bounded projects) is important for promoting sustainable change.

Conclusion

Evidence suggests that the SPSP sepsis VTE collaborative helped raise awareness and promote improvement in sepsis and VTE across Scotland. The challenges faced by sites on the ground in their improvement work on sepsis and VTE were very different, and were not all amenable to improvement by local project teams. Learning from the evaluation indicates a need for careful consideration of the appropriateness of a collaborative approach for future improvement work, with recognition that this will be heavily dependent on the nature of the topic and of the type of changes that are required. Future collaboratives will also benefit from considering lessons learned from the SPSP sepsis VTE collaborative about planning, building will, sharing learning, and supporting execution.

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