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Improvement collaboratives in health care

Evidence scan

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Health Foundation evidence scans provide information to help those involved in improving the quality of healthcare understand what research is available on particular topics.

Evidence scans provide a rapid collation of empirical research about a topic relevant to the Health Foundation's work. Although all of the evidence is sourced and compiled systematically, they are not systematic reviews. They do not seek to summarise theoretical literature or to explore in any depth the concepts covered by the scan or those arising from it.

This evidence scan was prepared by The Evidence Centre (info@evidencecentre.com).

The scan draws upon material from a systematic review previously published by the Health Foundation (www.health.org.uk/publications/collaboratives), as well as a new search for research about the effectiveness and key success factors of quality improvement collaboratives.

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Key messages

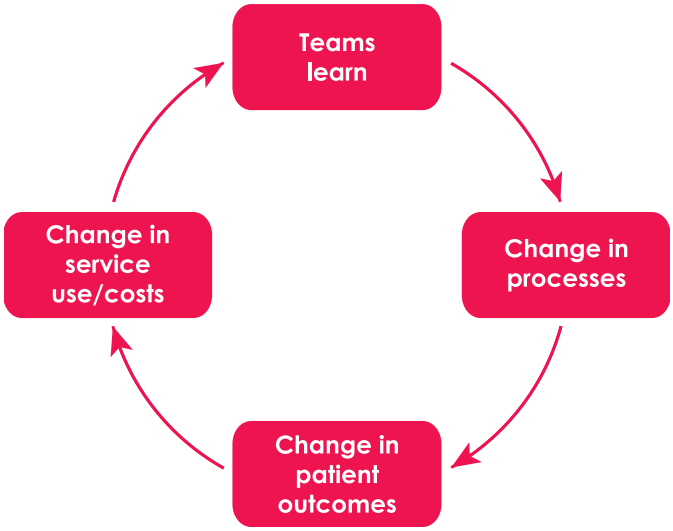
This scan compiles research about whether quality improvement collaboratives are effective.

Quality improvement collaboratives involve groups of professionals coming together, either from within an organisation or across multiple organisations, to learn from and motivate each other to improve the quality of health services. Collaboratives often use a structured approach, such as setting targets and undertaking rapid cycles of change. This evidence scan explores research about whether collaboratives help to improve quality in health care and the factors that may be key to their success.

Five bibliographic databases were searched for published journal articles available as of March 2014. A total of 232 studies were included in the scan. About 80% of these studies used a known 'model' for collaboratives, predominantly the Breakthrough Series approach developed by the US Institute of Healthcare Improvement (although many did not explicitly label themselves as such). A smaller proportion used a less structured 'communities of practice' approach or a combination of approaches.

Do collaboratives work?

The broad theory behind collaboratives is that, by collaborating and comparing practice, professionals and teams will be motivated to do things differently, which in turn improves patient outcomes and ultimately improves service use and costs.



The scan identified two systematic reviews, five randomised trials and 167 other studies examining the effects of collaboratives. Of the studies that examined effects, 33% of trials and reviews and 72% of other studies found a change in care processes; 20% of trials and reviews and 77% of other studies found improved patient outcomes, and 100% of trials and 89% of other studies found improved service use or costs, though numbers were small. Thus, there is more empirical evidence about the impact of collaboratives on direct changes to professional behaviour or care processes than on impacts on the quality of care for service users or health service outcomes.

Evidence about collaborative effectiveness

Impact	% of trials or reviews that found benefit	% of other studies that found benefit
Processes	33% of 3 studies	72% of 136 studies
Patient outcomes	20% of 5 studies	77% of 43 studies
Service use or costs	100% of 1 study	89% of 9 studies

A number of uncontrolled studies, often using before-and-after designs, have found improvements in symptoms, safety incidents, death rates and other patient outcomes. It may be difficult to attribute the effects to collaboratives because other interventions are sometimes implemented simultaneously and the research methods are not always robust. It is difficult to know whether collaboratives make improvements more quickly than 'traditional' improvement teams because research has not explicitly compared collaboratives with other approaches. The policy and geographic context in which collaboratives run may also influence success.

There is insufficient evidence to draw conclusions about the costs and the cost-effectiveness of collaboratives, or the long-term impacts, though there are positive trends in uncontrolled studies.

Only 15 studies about six collaboratives were identified from the UK. This is not to suggest that improvement collaboratives are not used in the UK, but rather that there may not be formally published studies about them.

What influences success?

While there is evidence to support exploring collaboratives further in the UK context, it cannot be assumed that collaboratives will immediately improve the quality and safety of care. Some collaboratives are more effective than others. The scan examined the characteristics that might influence the success of collaboratives.

Three systematic reviews, two randomised trials and 79 other studies contained information about factors contributing to whether collaboratives were effective. Important factors related to who, where, how and what is covered, however there was no clear evidence to conclude that one type of collaborative is better than others. Collaboratives vary widely in the topics covered and the settings they are used in so it is difficult to generalise about whether collaboratives are particularly effective for specific topics or in certain settings.

Taxonomy of collaborative characteristics

Domain	Attributes
Who?	Participants
	Facilitatators
Where?	Span (national, regional, local, within organisations)
	Organisation type (hospitals, primary care, nursing homes)
How?	Model (Breakthrough Series, communities of practice)
	Frequency of contact
	Duration of contact
	Interactions (face-to-face, online)
What?	Topic focus
	Measurement strategies
	Sustainability

Top tips

A number of collaboratives are being set up in the UK to improve health care quality. This scan suggests that collaboratives are not always successful but they are more likely to be effective if they do the following:

1. Focus on who should be included

- Gain buy-in from senior leaders who provide encouragement to take part.
- Involve multidisciplinary teams, including nurses.
- Consider involving patients and carers as part of the improvement teams.
- Include organisations that volunteer rather than making participation mandatory.

2. Consider the topic focus

- Focus on areas of change where a team approach is vital.
- Be realistic about what collaboratives can achieve.
- Focus on topics where there is established good practice and a large gap between current and ideal performance.
- Begin with an overall 'theory of change' so there is a clear link between activities and planned outcomes.

3. Consider how to run activities

- Set clear goals that team members buy into and are accountable for.
- Provide standardised change interventions but allow for tailoring to the local context and needs.
- Use multiple methods of communication to build a close participant network, including online and telephone support.
- Include organisational coaching in addition to collaborative learning sessions.

4. Provide appropriate resources

- Ensure there is an appropriate IT infrastructure for collating data and sharing good practice.
- Use simple measurement tools.
- Ensure organisational support, appropriate resourcing and enough time for changes to embed.
- Evaluate outcomes robustly, including comparing teams that do and do not succeed.

1. What is a collaborative?

This section describes what an improvement collaborative is and why it is important to consider whether they work.

Purpose

The NHS is facing increasing demand, workforce shortages and financial challenges.[1] Now, perhaps more than ever, there is a need to improve the quality, safety and efficiency of care. One approach suggested to support this is 'quality improvement collaboratives'[2] (hereafter collaboratives), whereby teams from multiple health care units or organisations work together in a structured way to share learning and improve the delivery of services.

Collaboratives have been implemented throughout North America and in some parts of Europe and Australia. They have been less well used in the UK, but policy makers and practitioners are interested in ascertaining whether they have a role to play locally.[3]

Collaboratives have been used as an improvement approach in health care for the past 20 years or so, but with mixed results. In the NHS, collaboratives have been proposed as a potential vehicle for change[4,5] so it is important to ensure that the design of these initiatives makes the best use of evidence about what works to enable a successful collaborative approach.

This evidence scan therefore addresses the questions:

- are collaboratives effective for improving the quality of health care?
- what factors may be associated with success?

Defining collaboratives

The literature contains various descriptions or definitions of collaboratives (see Box 1, overleaf, for examples).

A 2009 Health Foundation report that aimed to describe the effectiveness of quality improvement collaboratives by systematically reviewing empirical studies defined collaboratives as:

> *'a multi-organisational structured approach with five essential features: (1) there is a specified topic; (2) clinical experts and experts in quality improvement provide ideas and support for improvement; (3) multi-professional teams from multiple sites participate; (4) there is a model for improvement (setting targets, collecting data and testing changes); and (5) the collaborative process involves a series of structured activities.'*[6]

This scan takes a slightly broader approach, acknowledging that not all collaboratives follow the 'model for improvement' or include multiple organisations, however the aim of most collaboratives is to close the gap between potential and actual performance by testing and implementing changes quickly across many groups.

The difference from a traditional quality improvement team or project is that while similar methods may be used to plan and test changes, in a traditional approach the team chooses its own issue, spends time identifying the problems and analysing causes and then plans and tests changes. They may or may not draw on evidence about strategies for improvement and there may not be much existing evidence about 'what works' for the topic chosen.

In contrast, within a collaborative there is already a set topic to work on and the team is given evidence about effective change strategies to put into practice. The team also receives expert support in quality improvement plus benchmarking and stimulation from other teams.[7]

Collaboratives have been implemented in many different clinical areas and organisational contexts.[8] The earliest well-documented examples of collaboratives come from North America and include the Northern New England Cardiovascular Disease Study Group, which was established in 1986[9] and the Vermont Oxford Network, which was established in 1988.

Perhaps the most well known model is the 'Breakthrough collaborative' approach developed by the US Institute for Healthcare Improvement (IHI) in 1995.[10–12] This approach tends to last six to 15 months and aims to bring together a large number of teams to make improvements on a focused topic area where good evidence exists about 'best practice.' The approach is designed to help organisations make 'breakthrough' improvements to close the gap between current and best practice by facilitating a structure in which organisations can learn from each other and from other experts.

Box 1: Potential features of collaboratives[13–17]

Topic

- Topic selection is based on eliminating a gap between current and ideal practice
- Topic selection is based on the potential to improve outcomes for patients or systems
- The group commits to understanding its own processes and practices

Participants

- Multiple organisations or groups
- Critical mass of 25-40 sites to cultivate useful exchange
- Multi-professional teams
- Joint clinical and non-clinical teams
- Each site team may include 2-8 people
- Teams volunteer to participate

Process

- Time-limited
- Open sharing of outcome data and details of practice
- Identification of best practice in the group to learn from
- Building quality improvement skills
- Adapting improvement ideas to fit the context and resources of a specific organisation
- Using theory or model for improvement
- Rapid cycles of change
- 2-7 structured learning sessions plus conference calls and email groups
- Handouts/handbooks with 10-20 pages of information

Measurement

- Each organisation collects its own data
- Set measureable targets
- Benchmarking/baseline data
- Continuous tracking of a set of target indicators
- Monthly assessment of progress and exchange of reports

Resources

- Senior leadership support
- Peer support/peer pressure
- Spreading knowledge through reports and meetings
- Site visits by facilitators

Note: these characteristics do not necessarily apply to all collaboratives, but are provided as examples of the key features outlined in the literature.

Approach

To identify studies about collaboratives, the scan focused on readily available research published in journals in the UK and internationally. To be eligible for inclusion in the scan, studies had to:

- examine an initiative labelled as an 'improvement collaborative' or similar
- include empirical data
- be focused on health care
- be published in a print or online journal
- be published in the English language.

There were no geographical restrictions.

To identify relevant research, two reviewers independently searched five bibliographic databases for studies of any design. The databases comprised Pubmed/Medline, Embase, Cinahl, the Cochrane Library and Controlled Trials Register and PsychInfo.

All databases were searched for studies published between March 2008 and March 2014. This is because the Health Foundation undertook a systematic review of material published between 1995 and March 2008,[18] and studies from that review were also incorporated. That review included specific types of collaboratives (using the IHI 'model for improvement'), whereas the current scan was broader and included any intervention that defined itself as a collaborative.

Search terms for the current scan included: quality improvement collaborative, improvement collaborative, quality collaborative, learning collaborative, collaborative quality improvement, performance improvement collaborative, community of practice, clinical communities, consortium, Breakthrough, improvement network, clinical network, collaborative network and similes.

Abstract and title searches identified 7,174 studies, which were scanned for relevance. In addition to the 80 studies from the Health Foundation's previous systematic review, 152 empirical articles met the inclusion criteria, making a total of 232 studies included in the scan.

Table 1 illustrates the characteristics of the studies included. Six per cent were from the UK, 15% were from elsewhere in Europe, 72% were from North America and 6% were from other countries.

Five per cent of studies included in the scan were systematic reviews or randomised trials. Most studies of effectiveness used before-and-after or time series study designs, though a small number used some form of non-randomised comparison group. Most studies about key success factors used cross-sectional surveys, interviews or combined evaluation approaches.

There were multiple publications about some collaboratives. For example, although there were 15 articles from the UK, these focused on just six collaboratives. The Health Foundation's Safer Patients Initiative was the most widely published about UK collaborative.[19]

Table 1: Studies included in the scan

	Trial or review	Other study	Total
UK	-	15	15
Europe	2 trials 2 reviews	31	35
North America	5 trials 1 review	162	168
Other country	1 review	13	14
Total	11	221	232

Findings were extracted from all publications using a template and studies were grouped according to key themes to provide a narrative summary.

All of the evidence was sourced and compiled systematically, but the scan is not a systematic review and does not seek to summarise every study about quality improvement collaboratives. Instead the aim is to summarise key trends in readily available literature about the effectiveness of collaboratives and the factors that may influence their effectiveness. There was a particular emphasis on highlighting published research from the UK.

2. Do collaboratives work?

This section summarises studies about the impact of collaboratives on processes, patient outcomes, service use and costs.

Previous systematic and non-systematic reviews report mixed findings about the impact of collaboratives. While some reviews point to collaboratives' potential,[20] others suggest that there is insufficient evidence to state that collaboratives support sustained improvements in clinical outcomes or processes.[21,22] This diversity reflects the quality and quantity of empirical studies available and their differing methodologies and areas of focus.

For instance, a systematic review focused on nine controlled studies, two of which were randomised, found that seven studies (including one randomised trial) reported an effect of collaboratives on some process or outcomes measures. Two studies (including one randomised trial) did not show any significant effect. The reviewers concluded that the evidence about collaboratives is positive but limited and that the effects cannot be predicted with certainty.[23]

Another systematic review of 24 randomised controlled trials or quasi-experimental studies with comparison groups suggested that impacts were more likely in processes or professional behaviour change than patient outcomes.[24]

This scan sought to clarify the evidence base by including the most up-to-date research. Two systematic reviews, five randomised trials and 167 other studies examined the effectiveness of collaboratives. The most commonly explored impacts were changes in processes of care. Fewer studies examined the impact on patient outcomes, service use or costs, though a growing number of studies are now being published about patient outcomes. This section summarises research about each of these outcomes in turn.

Impact on care processes

Three randomised trials and 136 other studies examined the impact of collaboratives on organisational or care processes. Some of these studies also examined other outcomes.

There is mixed evidence about effectiveness. Two trials and 39 other studies found no improvement in care processes or service delivery.[25–30] This means that 66% of randomised trials and 28% of other studies that examined care processes found no impact from collaboratives.

For example, 44 hospitals in the US received a comparative feedback report before being randomly assigned to take part in a collaborative to improve preoperative antimicrobial prophylaxis or continuing usual practice. The collaborative comprised two meetings led by experts, monthly teleconferences and receiving supplemental materials for nine months. There was no difference between groups in the proportion of people who received properly timed antimicrobial prophylaxis, antibiotic duration, use of appropriate drugs or other outcomes. All hospitals had volunteered to take part so may have been motivated to change, whether or not they were ultimately assigned to the collaborative.[31]

However, one randomised trial[32] and 98 other studies observed positive changes in care processes following participation in a collaborative.[33–73] This equates to 33% of randomised trials and 72% of other studies that examined care processes.

Descriptive reports of implementing collaboratives suggest that teams often feel that they learn and adapt their processes.

> *'Participants reported that the collaborative experience allowed them to move beyond a focus on improving their own service to improving connections between services and viewing themselves as part of a larger system of care.'*[74]

Boxes 2, 3 and 4 contain examples from the UK.

Box 2: Example of an ambulance collaborative to improve care processes in England[75]

In England, a two-year collaborative aimed to improve ambulance care for people suffering a heart attack or stroke. Quality improvement teams were set up in each of 12 ambulance services, supported by a national expert group that conducted workshops about improvement methods. Teams shared ideas at three national workshops and improvement leads had monthly teleconferences. Annotated control charts were used to provide feedback about progress. The focus was on improving the delivery of care bundles (aspirin, glyceryl trinitrate, pain assessment and analgesia for heart attacks and face-arm-speech test, blood pressure and blood glucose recording for stroke). Analysis of change over time found significant improvements in heart attack care bundles in nine out of 12 services and in stroke care bundles in nine out of 12 services. Overall care bundle performance increased in England from 43% to 79% for heart attacks and from 83% to 96% for stroke.

Box 3: Example of a collaborative to improve safety processes in UK hospitals[76]

The UK Safer Patients Initiative (SPI) was based on the Breakthrough Series Collaborative model and aimed to improve patient safety in four clinical areas (general ward care, intensive care, perioperative care and pharmacy). Teams from 24 hospitals that took part were interviewed and surveyed retrospectively about the perceived impact of the collaborative. Taking part in the collaborative was thought to have impacted upon organisational culture, strategic priority, organisational capability and the quality of clinical care delivery systems. The evaluators concluded that collaboratives can have an impact upon the cultural, inter-professional, strategic and organisational aspects of care delivery as well as clinical working styles. Components that participants rated as important for success included using a quality improvement methodology, taking part in learning sessions, receiving support from external facilitators and focusing on predefined changes to clinical practice.

Box 4: Example of using a collaborative to embed a new type of worker[77]

In one region in England, a collaborative was used to support the use of 'graduate mental health workers' in primary care. Groups of practitioners from different organisations worked in a structured way to improve the quality of their service. There was an increase in new patients seen by the graduate mental health workers and increased workforce satisfaction. Qualitative feedback suggested that the collaborative aided the change process. Involving managers and commissioners from the commissioning primary care organisations appeared to be important.

There are examples from around the world of collaboratives achieving improvements in diverse processes relating to the following topics (among others):

- access to primary care[78,79]
- ambulance services[80]
- asthma care[81,82]
- caesarean sections[83]
- cancer screening and care[84–86]
- chronic obstructive pulmonary disease (COPD) care[87]
- depression care[88]
- diabetes care[89–95]
- emergency care[96,97]
- falls prevention[98]
- family-centred care[99]
- heart care[100–103]
- hospital-acquired infection processes[104–109]
- intensive care[110–112]
- medication safety processes[113–119]
- mental health[120]
- neonatal care[121–125]
- obesity care[126]
- organ donation[127–129]
- pain management[130,131]
- palliative care[132–134]
- patient flow[135–137]
- safety climate[138]
- stroke care[139,140]
- surgery.[141–145]

Some of the changes in care processes have implications for patient outcomes (such as reducing infections or death rates), but often the research focuses on the specific change in care processes rather than the impact for patients.

For instance, GPs in the Netherlands took part in a collaborative to reduce prescribing of antidepressants by using self-help and psychological treatment options for people with milder symptoms. Outcomes were compared with a non-participating non-randomised control group after three years. The collaborative was associated with a significant 23% decrease in antidepressant prescription rates for newly diagnosed patients with depressive symptoms, compared to no change in the non-participating group.[146]

In Canada, a regional collaborative was developed based on a community of practice model with a hub-and-spoke infrastructure and a steering committee. The community of practice aimed to help multidisciplinary teams from nine hospitals collect and compare their performance data and implement regional standards for cancer surgery. Over a three-year period there was a 20% increase in compliance with regional guidelines and greater standardisation of care.[147]

In the US, a collaborative aimed to improve communication between hospital doctors and primary care teams within two days of discharge. After an initial face-to-face meeting, email and regular teleconferences were used to support learning as individual teams set up improvement projects over a 12-month period. The average rate of documented timely discharge communication increased from 57% to 85%.[148]

Some collaboratives are large scale. In Australia, 1,185 primary care services participated in 13 waves of a collaborative between 2005 and 2011. Teams attended three workshops, separated by activity periods, and then undertook 12 months of further work. Teams were supported by local programme managers to make and report changes. Services received feedback about their progress compared with others. There were improvements reported in care processes for diabetes, heart disease, chronic obstructive pulmonary disease, patient self-management and minority group health.[149]

However, a number of 'positive' studies include mixed findings, with improvements in some processes of care but not others[150–153] or among some participating teams but not others.[154–159] For instance, a controlled before-and-after study in primary care practices found improvements in about half of the diabetes care processes examined.[160]

A US collaborative with 130 hospitals found that 35% reported reduced length of stay and 46% reported more discharges before noon. Sixty per cent of the hospitals that reported reduced length of stay sustained these improvements after the collaborative ended compared with 32% of hospitals reporting more discharges by noon.[161]

Most of the uncontrolled studies have design limitations and there may be publication bias whereby positive findings are more likely to be reported. While some of the changes observed are large, others are modest at best.[162]

The sustainability of changes after collaboratives end may also vary.[163] For instance, a follow-up study of 15 US practices that took part in a collaborative to improve screening for depression in primary care found that after three years 87% of practices were continuing with depression screening or monitoring using specific instruments. However, only 29% of the practices that initiated self-management support during the collaborative had sustained it. Tracking and case management was sustained by 50% of practices and 40% of practices continued to use a formal quality improvement strategy.[164] This example suggests that in the long term some simple changes may be sustained by the majority of participating organisations, but that fewer than half may continue with more complex or substantial changes.

Impact on patient outcomes

Five randomised trials and reviews and 43 other studies examined the impact of collaboratives on patient outcomes. Some of these studies also examined other outcomes.

Focusing first on the trials, a randomised trial with 43 primary care practices examined a 12-month collaborative aiming to improve processes and outcomes for children with asthma in the US. There were no significant differences between groups in processes of care, clinical outcomes or health service use.[165]

Another randomised trial with 114 neonatal intensive care units found some improvements in care processes but no significant differences in outcomes in 20 out of the 23 indicators.[166]

Ten non-randomised studies also found little evidence for immediate improvements in patient outcomes in asthma,[167,168] heart failure,[169,170] mental health,[171] infection rates,[172,173] patient experience[174] and other areas.[175] In fact, 80% of randomised trials and reviews and 23% of other studies that examined patient outcomes found no evidence of an impact from collaboratives.

However, there is some positive evidence. Twenty per cent of randomised trials and 77% of other studies that examined patient outcomes found an improvement associated with collaboratives.

Boxes 5 and 6 provide examples from the UK.

Box 5: Example of patient outcomes in a UK collaborative with general practices[176]

A 12-month collaborative with 19 general practices in England aimed to increase the number of people with kidney disease on practice registers and the proportion of patients on the register achieving nationally agreed blood pressure targets. The collaborative involved three joint learning sessions, interspersed with practice level rapid improvement cycles supported by an expert implementation team. The number of people on registers increased from 4,185 to 5,509 and the proportion achieving blood pressure targets increased from 34% to 74%. The collaborative approach helped teams test and apply changes but was more successful for some practices. The researchers suggested the need to develop more context-sensitive approaches to implementation and to actively manage factors influencing success.

Box 6: Example of patient outcomes from a UK collaborative within one UK hospital[177]

Five wards at one hospital in England used a collaborative to reduce rates of Clostridium difficile infection over a 10-month period. Results were compared with 35 wards not taking part. All wards received infection control guidelines. In addition, the collaborative wards participated in rapid cycles of change. In collaborative wards, there was a 73% reduction in infections compared with a 56% reduction in non-collaborative wards. This may suggest that the collaborative model enabled teams to test and implement strategies that accelerated change.

The one randomised trial that found a positive impact on patient outcomes took place with 10 public primary care centres in Mexico. The collaborative used the Breakthrough Series approach combined with the Chronic Care Model to improve blood sugar control in people with diabetes over an 18-month period. Changes focused on self-management support, decision support, delivery system design and clinical information systems. The collaborative was associated with an increase in the proportion of people who achieved blood sugar control (from 28% to 39%) and an increase in patients achieving three or more quality improvement goals (from 17% to 70%). There was no change in the control group.[178]

Non-randomised studies have found improvements over time in infant mortality and infections,[179–181] hospital-acquired infections,[182–188] surgical site infections,[189] pressure ulcers,[190,191] adverse drug events,[192–195] serious safety events,[196] surgical complications,[197] in-hospital mortality,[198] diabetes control,[199] blood pressure,[200] mental health,[201] pain in nursing home residents[202] and other indicators.[203]

For example, a before-and-after comparison of a collaborative to improve care for people with severe sepsis and septic shock found a reduction of in-hospital mortality from 43% to 29%.[204]

A collaborative with 743 primary care services in Australia was run in seven waves between 2004 and 2009. The proportion of people with diabetes who had target blood sugar control improved by 50% (25% at baseline versus 38% at month 18). Improvements in cholesterol and blood pressure were similar. The researchers acknowledged that the changes might reflect improved data recording and disease coding as well as changes in clinical care.[205]

In one of the only studies available comparing a collaborative to another improvement approach, surgical outcomes from 16 hospitals participating in a regional collaborative in one US state were compared with the outcomes for 126 hospitals in the same state participating in a national programme focused on improvements by individual teams. There was a reduction in morbidity in the collaborative group, but not in the other hospitals. There were no improvements in mortality in either group.

This study is important because it suggests that collaboratives may have the potential to spread good practice more promptly than other improvement activities, but the study was based on retrospective data analysis and the hospitals were not randomly assigned.[206]

While most collaboratives include multiple organisations, this is not always the case. In the US, a hospital that had previously taken part in a national collaborative set up an organisation-wide collaborative to reduce catheter-associated bloodstream infections in children. Care bundles were implemented and each individual unit was responsible for collecting data and performing event-cause analysis within 48 hours of identifying an infection. The results were shared with

other hospital units during monthly meetings. The hospital-wide catheter-associated bloodstream infection rate decreased from 3 to less than 1 per 1,000 line-days.[207]

As with improvements in care processes, changes in patient outcomes are sometimes mixed in individual studies. For example, a collaborative in the US found reduced pressure ulcer rates in paediatric intensive care but not neonatal intensive care.[208]

A small amount of research has examined the sustainability of changes in patient outcomes resulting from collaboratives. For instance, a non-randomised before-and-after analysis included data about 1,861 people with diabetes from 37 general practices and 13 outpatient clinics in six regions taking part in a collaborative and nine regions not taking part. The collaborative lasted for one year and follow-up was completed one year after the collaborative ended. There was a modest but significant improvement in blood pressure, but no lasting change in blood sugar control.[209]

Observational studies, such as those that prospectively or retrospectively track changes over time, are most likely to describe improvements in patient outcomes. However, some of these studies introduced other quality improvements simultaneously so it is difficult to differentiate the impact of the collaborative process versus what would be achieved by individual organisational improvements.[210] It is also true that the measurement strategies are sometimes limited, for example relying on professionals' assessments of whether there have been changes in patients' mental or physical health rather than more objective measures.[211]

Impact on service use and costs

One randomised trial and nine other studies examined the impact of collaboratives on health service use or costs. Some of these studies also examined other outcomes. The quantity of literature is small so each of these studies is briefly described in turn.

A randomised trial with 12 hospitals in the Netherlands aimed to increase the provision of thrombolysis for people with stroke using a collaborative. A cost-effectiveness analysis drew on data from 1,657 people admitted within four hours from the onset of ischaemic stroke. The thrombolysis rate in the collaborative group was 44% versus 40% in the control group, which was a statistically significant difference. Average costs per patient at three months were US$9,192 in the collaborative group and US$9,647 in the control group, a significant difference of US$455. The mean lifetime costs in the collaborative group were US$22,994 versus US$24,315 for the control group, a difference of US$1,321. The researchers concluded that the collaborative saved short- and estimated long-term health care costs due to lower hospital admission and residential costs.[212]

A controlled before-and-after study compared the impact on heart failure outcomes of a 12-month collaborative with 14 US primary care sites. People whose practice took part in the collaborative had similar numbers of outpatient visits but fewer emergency department visits and hospitalisations compared to controls. However there were no associated improvements in heart failure symptoms, self-management or self-efficacy.[213]

Another controlled before-and-after study examined outcomes from a neonatal intensive care unit taking part in a three-year collaborative compared to nine non-participating units. Treatment costs for infections were lower in units taking part, but there was no difference between groups in costs for lung disease.[214]

A US collaborative reported a 3% reduction in complications from general and vascular surgery, which translates into about 2,500 fewer patients in the state with surgical complications each year. Estimated annual savings were about US$20m, which far exceeded the cost of administering the collaborative.[215]

Another collaborative in the US focused on reducing one-day hospital admissions. Hospitals made changes to the admission process and educated doctors and case managers. This was associated with a 19% decrease in one-day stays in participating hospitals.[216]

Another US collaborative sought to reduce hospital admissions from 25 nursing homes over a six-month period. Tools and on-site education were provided and teleconferences were facilitated every two weeks by a nurse practitioner. There was a 17% reduction in self-reported hospital admissions compared to the same period the previous year. The 17 nursing homes that were rated as most engaged had a 24% reduction compared to a 6% reduction in eight nursing homes rated as not engaged and a 3% reduction in a comparison group of 11 nursing homes. The average cost of the six-month collaborative was US$7,700 per nursing home. The projected savings from a 100-bed nursing home were about US$125,000 per year. It is important to note that these estimates are based on self-reported admissions data.[217]

One hospital in the US used a collaborative approach to improve the quality and safety of parenteral nutrition. Although labelled as a collaborative, the research did

not make clear whether standard characteristics of collaboratives were included or differentiate between this and a more traditional improvement programme. Improvement strategies included revisions to order forms, education of clinicians, increased collaboration between pharmacists and dieticians and initiation of rounds during which relevant patients were reviewed twice weekly. There was an improvement in compliance with mandatory safe practice standards and a decrease in inappropriate use of parenteral nutrition. The average number of people receiving parenteral nutrition decreased from about 15 to less than five per day. This translated into a US$5.3m decrease in parenteral nutrition charges and pharmacy expenses decreased by US$107,000.[218]

Thirty-three Nigerian facilities took part in a collaborative to improve maternal and newborn care outcomes by increasing compliance with evidence-based standards. A study of intervention costs and cost-effectiveness compared baseline-monitoring data with costs two years later. The average cost per birth decreased from US$35 to US$28 and the incremental cost-effectiveness of the collaborative was estimated at US$147 per disability-adjusted life year averted. The researchers predicted cost savings if the intervention was spread to other facilities, with a 50% return on investment.[219]

A collaborative in the Netherlands was found to be cost-effective, drawing on data from 37 general practices and 13 outpatient clinics in six participating and nine non-participating regions.[220]

However, elsewhere in the Netherlands results were not as favourable. A collaborative sought to reduce pressure ulcers in 88 people in 25 nursing homes, assisted living facilities and home care teams. Over the course of one year the incidence of pressure ulcers decreased from 15% to 5% and health care costs increased by €2,000 per patient. The incremental cost-effectiveness ratio was between €78,500 and €131,000 depending on models of whether changes in the incidence and prevalence of pressure ulcers were sustained. The researchers concluded that compared to standard care, the collaborative was more costly but more effective in the short run and the long-term cost-effectiveness was questionable. The collaborative would only be cost-effective if changes were sustained.[221]

In total, 100% of randomised trials (one trial) and 89% of other studies that examined impacts on service use or costs found a benefit.

Collaboratives require substantial investments of time, effort and funding, although there is little evidence about the total investment needed to implement collaboratives robustly.[222] Overall, there is insufficient evidence to draw conclusions about the costs or cost-effectiveness of collaboratives as very few published journal articles contain these details.

Summary

To summarise the evidence, this scan identified two systematic reviews, five randomised trials and 167 other studies about the effectiveness of collaboratives.

Thirty-three per cent of trials and 72% of other studies that examined process improvements found a change in care processes. Twenty per cent of trials and 77% of other studies that examined patient outcomes found an improvement and 100% of trials and 89% of other studies that examined service use or costs found an improvement. Table 2 summarises these findings.

Table 2: Findings about benefits

Impact	% of trials or reviews that found benefit	% of other studies about this that found benefit
Processes	33% of 3 studies	72% of 136 studies
Patient outcomes	20% of 5 studies	77% of 43 studies
Service use or costs	100% of 1 study	89% of 9 studies

However, it is challenging to ascertain the effect of the collaborative process due to small sample sizes and other methodological issues, variations in the type and duration of collaboratives, implementing a variety of interventions simultaneously and the varying policy and health system contexts in which collaboratives run.

It is particularly difficult to consider whether collaboratives make improvements more quickly than 'traditional' improvement teams and whether the results last longer or the ideas spread more widely because research has not explicitly compared collaboratives with other approaches. In short, while there is some evidence that collaboratives may have potential, they may not always be associated with immediate or large-scale change and it is uncertain whether they are more or less effective than other approaches. The next section explores the characteristics of collaboratives that may impact on their outcomes.

3. What influences success?

This section describes research about the factors that may help or hinder the success of collaboratives.

A previous review focusing on nine controlled studies drew conclusions that remain valid even following this much larger scan:

> *'Considering that quality improvement collaboratives seem to play a key part in current strategies focused on accelerating improvement, but may have only modest effects on outcomes at best, further knowledge of the basic components, effectiveness, cost-effectiveness, and success factors is crucial to determine the value of quality improvement collaboratives.'*[223]

This section summarises what is known about the characteristics and success factors of collaboratives from the empirical literature.

It is possible to classify collaboratives using a basic taxonomy of characteristics (see Table 3). These characteristics may influence the extent to which collaboratives are successful.

The scan included three systematic reviews, three randomised trials and 79 other studies commenting about factors that may help or hinder collaborative processes or outcomes. Some of these studies also examined other issues.

Most research in this area is not comparative, which means that it focuses on opinions or observations of what might impact on success rather than comparing collaboratives or teams that do and do not incorporate a specific factor.[224]

Who?

Participants

It is a principle of most collaboratives to involve multi-professional teams and both clinical and non-clinical staff. It is difficult to assess the effect of this approach as studies do not usually compare other options. However, one study that compared clinics using multi-professional versus uni-professional teams within a collaborative found that multi-professional teams were more likely to implement comprehensive change interventions. The impact on outcomes was not reported.[225]

Some studies have found that involving nurses as part of the improvement team may be particularly useful for implementing change.[226,227]

UK studies have emphasised the importance of buy-in from junior doctors.[228]

A randomised trial in Mexico which found an improvement in patient outcomes suggested that involving patients as part of improvement teams was key to success.[229]

A systematic review of 23 studies of potential determinants of the success of collaboratives reported no empirical evidence of positive effects from leadership support, time or resources.[230] However many interview- and survey-based studies report that involving senior leaders is perceived as a success factor.[231,232]

For example, a survey of hospitals taking part in a large collaborative in the US found that the most important factors predicting success related to the perceived strength of organisational leadership in fostering a culture of quality improvement. This included the presence of a supportive hospital executive, the leaders' vision for how the collaborative advanced the hospital's strategic goals, staff recognition of a strong mandate for participating in the collaborative and using collaborative data to track quality outcomes.[233]

Table 3: Taxonomy of characteristics of collaboratives

Domain	Attributes	Subtype examples
Who?	Participants	Doctors Nurses Managers Allied professionals Level of organisational support
	Facilitators	Internal or external
Where?	Span	National Regional Local Within organisations
	Organisation type	Hospitals Primary care Nursing home
How?	Model	Breakthrough Series Communities of practice Unnamed model
	Frequency of contact	Fortnightly Monthly etc
	Duration of contact	Three months One year etc
	Interactions	Face-to-face Telephone Online
What?	Topic focus	Disease specific Focused on processes
	Measurement strategies	Robust measurement built in Monthly data collation etc
	Sustainability	Sustainability built in

An analysis of factors influencing success in mental health collaboratives in the Netherlands found that teams that received support from their management and active and inspirational team leadership had better results.[234]

It may not just be who participates in the collaborative on an individual or team basis that is important, but also the extent of organisational readiness. Thus 'participation' relates to broader leadership and organisational buy-in, as well as day-to-day participation of teams in activities.[235]

Box 7 provides an example from the UK.

Box 7: Example of the importance of leadership and organisational readiness

Interviews with 17 chief executive officers overseeing 19 organisations participating in the UK Safer Patients Initiative (described previously in Box 3) and 36 staff suggested that chief executives recognised the importance of senior leadership in supporting the collaborative. Key perceived roles for organisational leaders included motivating and engaging staff, providing resources, providing visible commitment and support to the approach, monitoring progress and embedding programme elements for sustainability. Leadership walk-rounds and reviewing programme progress at Board meetings were thought to be useful.[236]

A survey with 635 staff involved in the collaborative from 20 organisations found that participants perceived key success factors to include:

- well facilitated programme management
- the value assigned by the organisation and teams to the collaborative methodology
- the length of data collection
- perceived support from junior doctors
- inter-professional collaboration
- organisational readiness.[237]

Frontline staff were more likely to think there had been changes in care delivery processes and managers were more likely to think there had been changes in organisational culture. This suggests that the perceived value and impacts of collaboratives may differ depending on organisational role.[238]

A repeated survey of 284 professionals from 19 hospitals in England, Wales, Scotland and Northern Ireland suggested that this collaborative was associated with modest but significant improvements in patient safety climate and capability. Predictors of change included individual programme responsibility, the availability of early adopters and multi-professional collaboration.[239] Organisational readiness for change was also highlighted as an important variable.

> *'Prior to the start of organisation-wide quality- and safety-improvement programmes, organisations would benefit from an assessment of readiness with time spent in the preparation of the organisational infrastructure, processes and culture.'*[240]

A comparison of ambulance services in England that did or did not succeed in improving heart attack and stroke care bundles as part of a collaborative found that determinants of success included engagement with frontline clinicians, expert support and shared learning between participants and organisations.[241]

Engagement of professionals has also been found to be a success factor internationally. A collaborative with five community health centres in the US focused on weight management support for overweight people. Team members attended learning sessions and monthly teleconferences to build quality improvement skills and share best practices. Tailored coaching helped to address local needs. Key challenges included building support from the wider team of professionals, high staff turnover and difficulty tracking patient-level data.[242]

Studies exploring participation rates in collaborative activities suggest some room for improvement. For example, a collaborative lead by the Department of Public Health in one US state found that over a five-year period, 83% of target hospitals volunteered to take part. On average, 74% of relevant hospital representatives attended learning sessions, 55% participated in teleconferences and 54% attended regional meetings. The study did not explore whether different types of professionals were more likely to participate or whether there was a relationship between enhanced participation and improved patient care. However it does highlight that what is defined as 'participating' may vary greatly between organisations and teams.[243]

A survey of 915 hospitals that joined a collaborative in the US and 654 hospitals that did not found that participating hospitals were more likely to be larger, not-for-profit and teaching hospitals. Improving quality and wanting to 'do the right thing' were

commonly reported reasons for taking part, though meeting regulatory and accreditation requirements and enhancing reputation were also cited as primary reasons for joining. The researchers suggested that designing collaborative efforts to appeal to economic, regulatory, accreditation and professional motivators may increase participation.[244]

Repeated training in quality improvement methods may be needed during collaboratives to account for staff turnover.[245]

Facilitators

Some studies have commented on the team that supports and facilitates improvement collaboratives. This may be internal to the organisations taking part or may involve external quality improvement specialists. Research has not directly compared whether internal or external support is better, and studies individually examining both types of support have found similar outcomes.

Participants often suggest that good facilitation is crucial for supporting change and that external support from quality improvement experts is useful,[246–250] but it may be problematic to place value on this without comparing what would happen if such support were not available.

There is not always universal buy-in to the collaborative method and team members do not always feel that facilitation support has been useful.[251] This suggests that it may be important to select facilitators wisely, ensuring that they not only have quality improvement skills, but also the ability to engage and motivate teams.

Internationally, it has been suggested that using regional health departments or other existing local organisations to facilitate collaboratives could be worthwhile.[252] This might translate to clinical commissioning groups (CCGs) in England or regional health boards in Scotland.

Some authors suggest that sponsorship or regional-level funding can support more rapid rollout of collaboratives and this too is part of the facilitation process.[253]

Where?

Geographical span

Another characteristic of collaboratives that may impact on their effectiveness is the geographical span. Collaboratives can be run on a national basis or across regions or more local areas. They may also be conducted within a single organisation.[254]

Studies have not compared the pros and cons of different geographical contexts, and there is uncontrolled research demonstrating potential benefits from national, regional, local and single institution collaboratives. The majority of published research focuses on collaboratives on a regional or national scale, but the frequency of publications cannot be assumed to reflect greater effectiveness.

Some studies have suggested that recruiting participating teams on a regional scale helps to facilitate broad learning.[255] Other research suggests that the region in which collaboratives take place can be helpful or hindering, depending on the level of resources and encouragement provided and the broader health system culture.[256]

Organisation type

The types of organisations taking part in collaboratives could potentially impact on outcomes. Research is available about collaboratives made up of hospitals, or primary care organisations, or nursing homes or community organisations. Most collaboratives include one type of organisation or sector only, although there are a small number of examples of collaboratives including both primary care and hospitals.[257]

A study of a social services collaborative in Sweden found that teams from differing organisations needed more time to complete the collaborative processes than those run in clinical health care settings. This may be because it takes more time for differing organisations to learn about each other and how to work together, as opposed to very similar hospitals.[258] This is not to suggest that combining primary and secondary care or social services and local authorities within collaboratives is not effective, just that more time may be needed for the collaborative teams to begin working well together.

Due to the lack of comparative studies, it is difficult to suggest that collaboratives may work best with specific types of organisations. Examining the findings from individual studies suggests that positive impacts are just as likely in primary care as in hospitals or nursing homes, although one study did find that primary care organisations were more successful within collaboratives than mental health organisations.[259] The largest quantity of research is focused on the hospital environment, followed by primary care.

A study in the UK suggested that it may be challenging to develop multi-organisational communities of practice in primary care. Interviews, observation and documentary analysis explored how GPs, nurses, managers and improvement researchers could be encouraged to work together in a less formal type of

'collaborative'. The target was service improvement through sharing and cooperation, but there were less structured learning activities. The researchers found that a long period of time was needed to form multi-professional communities of practice and that these worked best within individual practices rather than sharing between practices. There was competition and strong organisational identification.[260]

Studies from the US have found that improvement from collaboratives may be more rapid or more marked in smaller organisations or practices.[261] However, the UK Safer Patients Initiative found that hospital type and size did not impact on the extent of change resulting from the collaborative.[262]

A US study examined whether the characteristics of primary care clinics taking part in a collaborative to improve HIV care impacted upon outcomes. Clinics with a more open culture and a greater emphasis on quality improvement attempted more change interventions and interventions that were of a larger scale. Those that used multidisciplinary teams and built in measurement of progress toward quantifiable goals were more likely to try more comprehensive interventions. The researchers concluded that clinic characteristics influence improvement activities, but the study did not comment on whether this impacted on outcomes.[263]

How?

Model

The manner in which collaboratives are run may impact on their effectiveness. The most commonly researched model is the Breakthrough Series approach promoted by the US Institute for Healthcare Improvement (see page 6). Some collaboratives may not identify themselves as following this model, but still contain the hallmarks of it.

The studies included in the scan generally used one of five approaches:

1. collaboratives based on the Breakthrough model (even if not named as such)[264–268]
2. collaboratives combining principles of the Breakthrough approach and the Chronic Care Model[269–274]
3. collaboratives based on other named approaches such as the Vermont Oxford Network[275,276]
4. communities of practice[277,278]
5. an unnamed or unclearly specified approach.

All of these approaches tend to involved rapid cycles of change.[279]

There were no studies explicitly comparing the outcomes from different types of collaboratives so it is difficult to comment about the most effective approaches.

Comparing the outcomes of individual studies did not suggest that one approach was more likely to be associated with favourable outcomes than others. The greatest amount of literature focused on Breakthrough models but the difference in quantity cannot be used to suggest that this approach is most effective.

A systematic review of 24 randomised controlled trials or quasi-experimental studies with comparison groups emphasised that reporting about how collaboratives were run was sometimes sparse. There were 14 common components such as in-person learning sessions, telephone meetings, data reporting, leadership involvement and training in quality improvement methods. Most collaboratives reported using six or seven of these components, most commonly in-person learning sessions, plan-do-study-act (PDSA) cycles, multidisciplinary quality improvement teams and data collection for quality improvement.[280]

Analysis of 11 collaboratives focused on cystic fibrosis found 10 essential elements contributed to success: national leadership and coordination; local leadership; involving patients and their families; transparency of registry data; having a standardised improvement curriculum with evidence-based change ideas; internet resources with reminders; team coaching; regular progress reporting and tracking; benchmarking site visits; and measurement.[281]

Focus groups with 19 professionals taking part in a collaborative in Norway identified three key success factors:

> *'(1) continuous and reliable information, including measurement, about best and current practice; (2) engagement of everybody in all phases of the improvement work: the patient and family, the leadership, the professional environment and the staff; and (3) an infrastructure based on improvement knowledge, with multidisciplinary teams, available coaching, learning systems and sustainability systems.'*[282]

Feedback from 53 teams taking part in collaboratives in the US found that the six features deemed most helpful for advancing improvement efforts were: external facilitation from experts; solicitation of ideas from staff; a change package; PDSA cycles; learning sessions; an internet site. These features provided motivation, social support and project management skills.[283]

While providing standardised change strategies for teams to follow is a hallmark of some models, there is research to suggest that this does not always work well and that local tailoring is needed.[284,285]

A case study of a collaborative in the Netherlands found that project teams did not use the standard change ideas provided because they wanted customised solutions that fitted within their context. Project teams did not implement and test change ideas within short timeframes because they took time to adapt standardised solutions to their context and align the interests of involved departments. In this collaborative the teams did not experience a great deal of peer stimulus because teams saw few similarities between the projects, rarely shared experiences and were not competitive.[286]

A 12-month collaborative to improve patient experience in eight medical groups in the US included bi-monthly meetings, an online tool reporting monthly data and a resource manual. There were small improvements in patient experience in some groups, but in others changes were mixed and not consistently linked to team actions. The two most successful groups appeared to have strong quality improvement structures in place and focused on relatively simple interventions. Having frequent data reports helped to stimulate improvement. Coordinators reported that more time and support was needed to engage clinicians and managers to change behaviour. The researchers concluded that sustaining change is likely to require organisational strategies, engaged leadership, cultural change, regular measurement and feedback, and training in how to use data.[287]

A collaborative in local government in the US found that it is helpful to generate a shared vision, recognise that one size does not fit all, use data to help fuel participant engagement, break a long collaborative into smaller segments, and pay providers to offset the costs of participation and enhance their engagement.[288]

Another US study found that teams that made the greatest improvements established clear roles and goals, had previous quality improvement training, made more use of quality improvement tools and incorporated education into their improvement work.[289]

Some research suggests that it is competition between organisations, rather than cooperation, which is an important component of collaborative models. Interviews with 12 hospital ICU teams found that taking part in a collaborative was perceived to promote increased cooperation within local teams rather than inter-organisational cooperation. Friendly competition with other ICUs was a driver of behaviour change. Increasing inter-organisational legitimisation, communication and collaboration were less important or less likely to be seen as drivers of change than competition.[290]

Researchers have tested whether the degree of participation, baseline performance, receipt of funding for providing the targeted care, and mandated or voluntary participation influences outcomes. There were no clear trends.[291–293]

Frequency of contact

Collaboratives may meet or be in contact every month, every three months or at other intervals. As with other characteristics, studies have not compared these different approaches.

Examining the outcomes from individual studies suggests that contact at least every one to two months may be associated with continued motivation, shared learning and benchmarking against others.[294]

In nursing homes taking part in a collaborative in the US, reductions in fall rates were highest in facilities where participants experienced the highest levels of communication with collaborative members outside scheduled meetings and where participants thought that the collaborative kept them informed and provided new ideas. In other words, the frequency of contact was thought to be an important success factor.[295]

Duration of contact

The duration of collaboratives in the research literature varies widely. Most range from about six months to three years.

Research has not directly compared the outcomes of longer versus shorter collaboratives. However, examining the outcomes from individual studies suggests that longer duration may be associated with more measurable changes in processes and patient outcomes.[296] This may be because it takes time for the changes to embed and be reflected in quantifiable metrics.

Studies from the UK have suggested that a longer data collection period may be associated with greater perceived impact among participants.[297] Research from other parts of the world has found that improvements may materialise after collaboratives end, suggesting that new processes may need time to embed.[298]

A systematic review of 23 studies of potential determinants of the success of collaboratives found that some aspects of teamwork and participation in specific collaborative activities enhanced short-term success.

If teams remained intact over time and continued to gather data, the likelihood of long-term success increased.[299]

Type of contact

Most collaboratives in the research literature involve face-to-face contact, sometimes supported by online, email or telephone support between meetings.

Having structured learning sessions and follow-up support has been reported to facilitate change within collaboratives.[300,301]

A randomised trial in the US examined the components of collaboratives that may work best. Two hundred and one addiction treatment clinics were randomised to group teleconferences (controls), clinic-level coaching, large face-to-face meetings or a combination of all three. Coaching, face-to-face meetings and combination approaches were all associated with reduced waiting times and increased recruitment of new patients. None of the groups improved patient retention. Teleconferences had no effect on outcomes. The estimated cost per clinic was US$2,878 for coaching versus US$7,930 for the combination approach. The researchers concluded that clinic coaching and the combination approaches were equally effective in improving processes, but coaching was substantially less expensive. Teleconferences and learning sessions were not thought to add value over coaching alone.[302]

A survey of 52 teams participating in four collaboratives in the US found that the more teams used inter-organisational learning activities offered by the collaborative, the more their organisations' performance improved. Using bespoke learning activities within individual organisations taking part in the collaboratives did not multiply the effect.[303]

However, not having good structures in place to support communication between teams, or not having a stable workforce to coordinate with can be barriers.

> *'Technical resources and support, a stable workforce with adequate training, and adequate opportunities for collaborator communications are particular challenges.'*[304]

Knowledge is emerging about collaboratives and structured communities of practice run largely via the internet or telephone.[305–307]

A US study compared a virtual collaborative with an improvement toolkit for reducing central line-associated bloodstream infections and ventilator-associated pneumonia in 60 intensive care units (ICUs) over a 19-month period. The virtual collaborative was associated with quicker uptake of improvement interventions and greater uptake of one of the care bundles. However, there was no difference between groups in changes in infection rates. Neither group improved outcomes over time. The researchers concluded that incorporating quality improvement methods such as ICU checklists into routine care processes is complex and may take longer than 18 months and require more hands-on support than via a virtual collaborative.[308]

On the other hand, seven primary care clinics in rural parts of the US participated in a telephone collaborative to support healthy eating among obese children. Over a nine-month period, clinics were supported to implement best practices and exchange strategies for improvement. The collaborative was associated with improved documentation of weight assessment and counselling.[309]

Similarly, an online collaborative was developed in the US to help 29 paediatric practices implement continuous quality improvement. Practices conducted baseline and monthly chart audits, took part in webinars and undertook monthly practice changes using PDSA cycles. Feedback was provided to practices periodically about their performance. Using the online platform was associated with improvements in documentation, screening, counselling and management of obesity.[310]

What?

Topic focus

Another way that collaboratives vary is in the topic of interest. The studies included in the scan tended to focus on measuring improvements in processes of care and, to a lesser extent, improvements in patient outcomes. Changes were more common when the focus was on improving process of care. This may be because sample sizes were too small or the duration of follow-up was too short to demonstrate changes in patient outcomes.

As outlined in the previous section, uncontrolled studies have suggested improvements in processes related to a range of long-term and other conditions, patient safety, primary care and hospital care. There does not appear to be a particular group of topics that collaboratives work best with. However, some studies that do not show an impact focus on very specialised topics and areas where there may already be good uptake of best practice or little scope for improvement.[311] Research suggests that

it may be important to use a structured approach to decide on the topic areas and ensure that content can be adapted to local contexts.[312]

A study in the US found that collaboratives focused on long-term conditions may be more likely to achieve their goals. The most successful collaboratives included clear target objectives, timeframes, metrics and well-defined processes. Having interventions that clearly and logically aligned with the topic area was associated with success.[313]

However, feedback from 75 team leaders taking part in collaboratives in the Netherlands suggested that selecting topics for which there are best practices and evidence of effective interventions did not necessarily result in greater success of collaboratives.[314]

Measurement strategies

The measurement strategies used within collaboratives may influence success in terms of what is measured, but also how motivated members are to collate and use information for improvement.[315,316] Having relevant measures and easy-to-use computerised data collection tools may facilitate success.[317,318,319,320,321,322] If the data collection tools and processes are not acceptable to teams, they may not collect adequate follow-up data and this can impact on the extent to which collaboratives demonstrate an improvement.[323] Using real-time data to plan change has been found to be useful.[324]

> *'Measurement is an essential component of the model for improvement, necessary to determine whether changes made have resulted in improvement. Measures used for quality improvement should be based on evidence and consensus, be clear and collectable in a timely fashion, occur with sufficient frequency, and have the potential to improve outcomes.'*[325]

A collaborative of ambulance services in England found that feedback using annotated control charts, provider prompts and individualised or team feedback all worked well to support improvements in care processes.[326]

A large collaborative in Australia found that early investment to facilitate automatic collection of data ensured good reporting.[327]

Other studies have suggested that a lack of good data collection systems or lack of investment in appropriate IT can act as barriers to collaboratives.[328–330]

Sustainability

Qualitative research based on feedback from teams participating in collaboratives suggests that building in strategies for sustainability throughout may impact on the extent to which changes remain embedded within organisations.

For example, repeated interviews with programme coordinators from 20 sites participating in the UK Safer Patients Initiative explored strategies to facilitate the sustainability of the collaborative. Suggestions for embedding change after collaboratives ended included aligning the new approaches with external requirements, continuing to use improvement methodologies and measuring outcomes to retain buy-in, and maintaining buy-in from senior leaders to support organisational strategies for sustainability.[331]

In Sweden, multidisciplinary teams from 19 hospitals took part in a collaborative to improve care for heart attacks. Data were compared with 19 matched hospitals that acted as blinded controls. During the collaborative, procedural performance and clinical outcomes improved, but this was not generally sustained six months after the collaborative ended. The researchers suggested that using a national quality registry to help measure progress was useful during the collaborative and that promoting the ongoing use of such measurement tools may help to sustain changes.[332]

Interviews with 25 people from 13 primary care practices that had taken part in a collaborative five months earlier suggested that the sustainability of changes depended on having regular meetings to study practice population data, leadership commitment, the availability of infrastructure and staff support, pursuing additional funding, publicity and strategic partnerships. About half of the practices had sustained activities after the collaborative ended.[333]

Summary

This section has itemised some of the key characteristics of collaboratives and considered research about whether these characteristics may impact on success. There is not a great deal of good quality empirical research about success factors. Most of the available material is not comparative and instead draws on participants' opinions about what was important. Most of this material has something in common: the suggestion that it is not one or two factors that most influence success, but rather a combination of processes and support.

Box 8 provides an example from the UK.

Box 8: Example of perceived success factors in a UK collaborative[334]

Forty professionals who took part in a collaborative learning programme for general practices in Scotland provided feedback about which components were most useful. This was not necessarily a standard improvement collaborative with set targets, but rather a 'looser' joint learning approach. Professionals reported that taking part in the programme was useful and enhanced communication within the general practice team. External facilitation reportedly provided focus and helped to reduce inter-professional barriers. Teams found working in small, mixed-role discussion groups valuable to help understand each other's perspectives. Participants said that the active learning style could be daunting but teams valued the chance to identify their own quality improvement goals and introduced a number of changes to improve the quality of care within their practice as a result of taking part. The researchers concluded that facilitation and the provision of appropriate resources can help primary care teams apply quality improvement ideas in practice.

A hospital in the US used a collaborative to reduce health care-associated methicillin-resistant Staphylococcus aureus (MRSA) and central-line-associated bloodstream infections. The evaluators suggested that in order to be successful, a range of coordinated, systems-level interventions were needed.

> *'Critical project success factors were believed to include creating organisational alignment by declaring eliminating healthcare-associated infections as an organisational breakthrough goal, having the organisation's executive leadership highly engaged in the project, coordination by an experienced and effective project leader and manager, collaboration by multidisciplinary project teams, and promoting transparency of results across the organisation.'*[335]

Another US study concluded that early data reporting, preparation for the first learning session, monthly narrative reports from organisations, and clear and concrete change packages are all integral to the collaborative improvement process.[336] The message is that it is the combination of characteristics that is useful, drawing together facilitation, data usage and ongoing feedback and learning.[337,338]

Most of the potential success factors researched relate to characteristics of the collaboratives themselves, but it is important to recognise that wider factors may be at work. The health system in which collaboratives are set up, local and national policies and drivers, incentive schemes, staffing levels and priorities and many other meso and macro-level factors are likely to have an impact. This evidence scan does not explore these potential sources of variation because they have not been addressed in the empirical literature, but this does not mean that they are not important in terms of explaining why some collaboratives may be more successful and sustainable than others.

4. Summary: which collaboratives work best?

This section summarises top tips for creating and sustaining a successful collaborative.

Do collaboratives support improvement?

This scan suggests that collaboratives may have some potential to support improvements in the quality of health care but, like most initiatives, they are not a 'silver bullet' and cannot be relied upon in isolation to spread broad change. This conclusion mirrors the findings of previous smaller reviews, which suggest that there is modest high quality evidence for collaboratives and that collaboratives may have more impact on provider behaviour than patient outcomes.[339–341]

It is difficult to draw conclusions about whether collaboratives make improvements more quickly than 'traditional' improvement teams and whether the results last longer or the ideas spread more widely because research has not explicitly compared collaboratives with other approaches.

There is some qualitative evidence to suggest that teams value having a set topic to work on and evidence-based strategies to implement rather than 'starting from scratch' as an individual improvement team. However whether this leads to faster uptake of good practice remains uncertain.

This is important because while before-and-after studies often suggest that collaboratives are associated with improvements in care processes and some patient outcomes, these same changes may have been evident if an individual organisation worked on the topic alone rather than as part of a collaborative. The extra improvement and speed associated with collaborative efforts remains unclear.

The small number of empirical studies from the UK mirror trends in the international literature. Broadly, there is some evidence from uncontrolled studies that collaboratives have the potential to impact on processes of care, and to a lesser extent, patient outcomes. However, there is wide variation in collaborative processes and outcomes.

While this scan summarises evidence from numerous papers, it does not seek to analyse the reasons for the findings. The mixed findings about impacts could be due to many factors, including the context in which collaboratives are implemented. The scan has drawn together evidence from different countries, yet the policy ecosystem in these health systems is very different and the organisations taking part in and supporting the collaboratives are also likely to vary widely. It is therefore not surprising that the results are mixed.

Do different approaches influence outcomes?

Many studies about collaboratives are based on the IHI Breakthrough Series model, even if they are not explicitly named as such. By this we mean that they focus on a specified topic, are facilitated by clinical experts and experts in quality improvement, include a series of structured learning activities, involve multi-professional teams from multiple sites and use rapid cycles of testing change and adapting (PDSA cycles). Other approaches may be less structured 'communities of practice' where organisations do not necessarily all focus on the same topic area or which have a less systematic programme of learning activities.

It is difficult to conclude that one approach is more effective than others because studies do not compare the outcomes of varying models. Furthermore, even within a single model there are wide variations in the structure, approach and activities used.

What helps and hinders implementation?

To succeed, it appears that collaboratives must be well planned and resourced, encompass passionate professionals and leaders, have realistic expectations and be given enough time to show an impact. Impacts may be small at first and focus on care processes rather than downstream improvements for patients and systems.

A systematic review identified factors associated with the effectiveness and sustainability of networks for professionals. Twenty six studies were included, some of which involved collaboratives. There was some evidence that cohesive and collaborative health professional networks may facilitate the coordination of care, but potential barriers included cliques and over-reliance on central agencies or individuals.

'This requires efficient transmission of information and social and professional interaction within and across networks. For those using networks to improve care, recurring success factors are understanding your network's characteristics, attending to its functioning and investing time in facilitating its improvement. Despite this, there is no guarantee that time spent on networks will necessarily improve patient care.'[342]

The research points to areas that policy makers and practitioners may wish to consider when setting up collaboratives.[343] There is no simple answer about which collaboratives may be most effective, but Box 9 provides tips to act as a starting point for success.

Box 9: Top tips to consider when establishing a collaborative

Who should be included?

- Gain buy-in from senior leaders who provide encouragement to take part.
- Involve multidisciplinary teams, including nurses.
- Consider involving patients and carers as part of the improvement teams.
- Include organisations that volunteer rather than making participation mandatory.

What should the focus be?

- Focus on areas of change where a team approach is vital.
- Be realistic about what collaboratives can achieve.
- Focus on topics where there is established good practice and a large gap between current and ideal performance.
- Begin with a 'theory of change' so there is a clear link between activities and planned outcomes.

How should the collaborative run?

- Set clear goals that team members buy into and are held accountable for.
- Provide standardised change interventions but allow for tailoring to the local context and needs.
- Use multiple methods of communication to build a close participant network, including online and telephone support.
- Include organisational coaching in addition to collaborative learning sessions.

What resources are needed?

- Ensure there is a solid IT infrastructure for collating data and sharing practice.
- Use simple measurement tools.
- Ensure organisational support, appropriate resourcing and enough time for changes to embed.
- Evaluate outcomes robustly, including comparing teams that do and do not succeed.

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