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Formative qualitative evaluation of an improvement programme delivered in an English hospital trust to reduce harm from pressure ulcers

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Background Pressure ulcers (PUs) are a leading cause of preventable harm globally and can cause patients significant pain, infection and, in rare incidents, death. There is a strong evidence base for how to improve PUs and one UK healthcare trust used this evidence to develop a quality improvement (QI) programme using the Institute of Healthcare Improvement's Breakthrough Series collaborative model. 20 teams, from both acute and community settings, participated in the first two phases of the collaborative. The delivery of both phases used virtual delivery using the Institute of Healthcare Improvement's improvement model. This study sought to formatively evaluate the early phases of the collaborative, to support learning and continual improvements to the collaborative programme and other collaboratives delivered by the organisation based on the formative evaluation.

Methods Semi-structured interviews were conducted with purposively sampled participants to explore their perspectives about the implementation of the programme, interventions tested as part of the 'change package' provided and the pandemic's impact.

Results A total of seven participants were interviewed, including acute ward managers, a charge nurse (deputy ward manager), a wound healing community nurse and a team leader community nurse. Interview durations varied from 9 min to 28 min. The interviews were kept short and stopped when data saturation was achieved as it was an extremely pressurised time for the organisation where the highest escalation alert was triggered on numerous occasions.

Conclusion A sustained reduction in PUs was achieved during the evaluation period and participants felt that the approach helped to achieve this, regardless of the adaptations made to the delivery method due to the pandemic. To support improvements, it is vital to ensure systems such as data collection are accurate and timely. The necessity for building strong foundations for QI capability must not be underestimated, as greater QI knowledge leads to better engagement and outcomes.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Quality improvement (QI) collaborative approaches can be used to reduce harm in healthcare settings and have been used by many organisations for different topics including pressure ulcer (PU) reduction.

⇒ It is important to formatively evaluate collaborative approaches and support vital improvements and adaptations that must be made. For example, in response to pressurised times, such as the COVID-19 pandemic period. It is well-known that systematic evaluation of QI programmes does not occur enough, impeding the improvement of programmes delivered by organisations.

WHAT THIS STUDY ADDS

⇒ This study used implementation theory to evaluate an improvement programme from the perspective of participants. The programme achieved significant improvements indicating that sustained reduction in PUs is possible using a QI collaborative approach even during pressurised times. Interview data supported quantitative PU data that showed that sustained reduction in PUs was achieved during the evaluation period. Despite some initial scepticism at the start of the collaborative, all participants felt that the approach was useful for reducing PUs, regardless of the adaptations made due to the pandemic.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ The study highlights the importance of continuing QI efforts regardless of additional pressure and the importance of developing staff QI capability to support making QI part of everyday practice. The study also demonstrates the benefits of using implementation theory and qualitative interviews to formatively evaluate QI programmes as they are being delivered.

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BACKGROUND

A number of investigations into healthcare failures and reports over the last few decades have recommended the need for more proactive approaches towards improving care in healthcare organisations that involve frontline staff.[1 2] Reports into healthcare failures tend to highlight specific issues faced by organisations, however, they also often make a number of suggestions that all organisations can learn from. For example, the Berwick report, which was published after failures at one UK National Health Service

trust, specifically stated that all staff needed to 'Appreciate that your responsibility is not only to your patients but also to help continuously improve the healthcare system in collaboration with others'[2] which highlights the need to directly involve frontline staff in improving safety concerns.

To help staff to continuously improve healthcare systems, quality improvement (QI) methods can be particularly helpful, as they allow frontline staff to lead on small improvements that can be refined and gradually scaled-up over time.[3] With this in mind, one trust in the North-West of England, developed a QI strategy in 2019 that specifically focused on improving patient safety, by encouraging frontline staff to lead on improvements. In line with the strategy, the trust's Director of Nursing, Allied Health Professionals, Midwifery and Quality led a call to action in January 2020[4] supported by the executive team to reduce avoidable harms. This call to action specifically focused on pressure ulcer (PU)-related harm, as there were a high number of patients experiencing this type of harm and there had even been deaths related to PU harm. Therefore, reducing PUs was a high priority for the organisation, due to their impact on patients' harm and quality of life. Furthermore, the fact that the trust was an outlier, compared with neighbouring trusts in terms of a higher PU prevalence.

Following the call to action, a PU collaborative was designed,[5] details of the design, development and delivery of this collaborative can be requested from the corresponding author. In brief, the collaborative was based on the Institute of Healthcare Improvement's 'Breakthrough Series Collaborative model (BTS)'.[5] The BTS model can be found in online supplemental file 2. In summary, it involves a structured approach to supporting a number of teams to improve together using a combination of learning sessions, action periods (where improvements are tested) and support from a coach. During the collaborative, teams are provided with an evidence-based 'change package', to use as a guide to help them achieve their aims,[5] which in this collaborative was to reduce the proportion of patients who developed PUs while under the care of the trust. There is a strong body of evidence supporting the use of this model to reduce PUs.[6–8] However, there is limited evidence about staff perspectives and how the programmes have been implemented using theory. This is particularly important to explore as this collaborative was delivered during the COVID-19 pandemic, despite being designed prior to the pandemic. This meant that many adaptions were required to allow for the collaborative to take place. This included the use of virtual forums and risk assessments for interactions between staff.[9]

The programme was formatively evaluated throughout its delivery which helped to gain information about how best to revise and modify the work that took place, and to explore whether improvement was achieved.[9] This was particularly important as many programmes focusing on reducing harm were paused during the pandemic, for example, elements of NHS England's National Patient Safety Programme were paused.[10] However, the incidence of harm did not pause, and it is important to learn how such programmes can continue successfully during a pandemic, and then be adapted for the post-pandemic world. Learning from the changes that healthcare organisations have faced during the COVID-19 pandemic must be used to help prepare for any future similar threats. Increasing the use of virtual platforms is of paramount importance in the face of changing patient needs and ongoing staffing pressures which can change at any second, for example, in response to new variants of COVID-19.

Aim

The aim of this evaluation was to generate new knowledge and lessons learnt, so that it could inform the running of similar quality improvement programmes within our organisation and other organisations. Evaluation has helped shape and develop the approach to other collaboratives both virtually and face-to-face.

METHODS

Qualitative interviews were used to explore whether the collaborative and related interventions were normalised into practice successfully, from the perspective of the staff involved with the collaborative, using normalisation process theory (NPT) to guide interviews and analysis.

A purposive sample of staff (n=7) from acute and community nursing teams within the trust were interviewed, this included acute ward managers (n=3), charge nurses from acute wards (n=2), a community team leader nurse and a community nurse (district nurse).

Interviews were conducted by the first author (AD), who is a QI programme manager and registered nurse with a BA (Hons) and BSc. During the interview phase, AD was closely supervised and supported by the ultimate author (PR). PR is an experienced researcher with a PhD evaluating QI and is a registered pharmacist.

A semi-structured interview schedule was used based on NPT.[11] NPT is a framework that can be used to describe, assess and enhance implementation to see how changes can be 'normalised' into practice.[11] Specific contextual factors were considered during recruitment, such as the types of wards or community teams and the impact that the COVID-19 pandemic had on their availability. Interviews were recorded with the participant's consent, and all participants signed a consent form.

Staff were approached via email with the opportunity to join the interview process. Although no personal relationships were established prior to study commencement, some participants were known to the main researcher (AD), within a professional capacity. At the start of each interview, it was explained that the interviews were voluntary and that there were no wrong or right answers and that their views were important. An

Table 1 Summary of themes based on normalisation process theory constructs

Normalisation process theory construct	Description	Definition
Cognitive participation (engagement with the collaborative)	Facilitators for engagement	Factors that staff felt that helped them to engage with the collaborative.
	Empowerment (including champions)	How staff have felt supported to lead on improvement.
	Barriers to engagement	Factors that made it difficult to engage with the collaborative (non-COVID-19 related).
	Impact of COVID-19 on engagement	Factors that impacted engagement related to the COVID-19 pandemic.
Coherence (understanding of collaborative, its need and quality improvement)	Understanding of need for PU improvement	Did participants understand the collaborative, QI and interventions and why they were needed?
	Understanding of collaborative	Did participants understand the collaborative and methodology?
	Experience of QI	How much experience of QI did participants have and the impact on understanding the collaborative?
Collective action (actions taken to spread improvement and learning)	Actions to increase use of QI methods	What actions did participants take to scale up the use of QI methodology.
	Actions taken to scale up interventions	Actions the implementation of improvements from the change package.
	Action to increase engagement with collaborative	Any actions that helped get colleagues involved with the collaborative or wider improvements that resulted from the collaborative.
Reflexive monitoring (reviewing data, own progress and other teams' progress)	Understanding and reviewing own data	How data were used and changes to the process of data collection to suit individual team circumstances. Including elements for the future.
	Monitoring peers	Monitoring what other teams are doing for learning purposes.

PU, pressure ulcer; QI, quality improvement.

interview guide was used, which has been included (see online supplemental file 1). The interview guide was pilot-tested with a nurse.

The interviews were conducted virtually or in person (at the participant's place of work) and audio recorded. Recordings were transcribed by the first author and a trust approved transcription company. The framework in table 1, based on NPT,[11] was used to analyse data. Analysis was aided by NVivo V.12,[12] interviews were coded by AD with supervision from PR. AD and PR worked together to categorise data and group data into emerging themes and subthemes. A deductive approach to analysis was used, with interview excerpts being constantly compared with the descriptive themes displayed in table 1.

Ethics

According to the National Health Service (NHS) research ethics decision tool[13] this work was service evaluation rather than research; therefore, approval from an NHS Research Ethics Committee was not required. Written consent for interviewing was obtained from all participants.

Patient and public involvement

Plans for the collaborative programme, that has been evaluated, were presented to patient volunteers during the initial stages of the programme and amendments were made based on their feedback. Members of the expert faculty and participants, including the associate director of QI and frontline community nurses, visited patients with PUs, including those cared for at home, to understand their experiences, which helped to shape the collaborative programme. Updates and findings from the evaluation have also been presented at various events and meetings within the trust, including those where patient and public members may attend, such as public board.

RESULTS

The themes from the interviews have been summarised in table 1.

A total of seven participants were interviewed, including acute ward managers (n=3), charge nurses from acute wards (n=2), a community team leader nurse and a community nurse (district nurse). Interviews were conducted over a period of 4 months (between May 2021

and September 2021). Interviews ranged in length from 9 min to 28 min.

The interview data helped to provide an illustrative account of the impact of reducing PUs in both acute and community settings from the perspective of collaborative participants.

The evaluation team agreed that data saturation was achieved after the first five interviews. However, two further interviews were conducted to ensure this, and no new information was highlighted regarding the evaluation questions. The findings from this evaluation were used to improve the collaborative as the data was collected.

A purposive sample of participants was selected to ensure a wide range of perspectives were represented, as outlined in the methods section. The evaluation team was also mindful of taking staff away from their patient-facing roles, particularly during the COVID-19 pandemic, as a 'major incident' was declared during the interview period due to pressures within the organisation.

The interview data has been presented under each theme from the framework presented in table 1. Words in brackets and ellipsis (…) have been used to remove identifiable data or to help clarify meanings.

Cognitive participation

Facilitators for engagement

Participants felt that engagement with the collaborative was greater if team members had previous experience and interest in PU reduction.

> It's helped … that I put (staff) into the collaborative (who) were really interested in PU prevention and coming up with new ideas. Participant 1, acute ward manager

This highlights that there are a number of staff who want to be more involved with improving harm, in line with report recommendations to involve frontline staff with improving safety concerns.[2] Furthermore, knowledge of QI methodology does seem to facilitate more engagement as participants who had displayed interest in QI prior to the collaborative felt that they were more engaged at the beginning of the collaborative, than those who had less awareness of QI.

> I did some sort of external (QI) training course. So, I had a bit of an understanding about process mapping and things like that. What we did in the collaborative was a part of it. Participant 6, community team manager

Some participants reported that they wanted to be involved because they were new to the team and therefore suggested they were energised towards getting involved with new things.

> I put myself forward, I volunteered to be part of the collaborative, because I was fairly new to the ward. Participant 1, acute ward manager

Teams were also influenced to be more engaged with the collaborative if they had heard positive feedback from teams that had been previously involved in the collaborative.

> A previous team… said … (the collaborative is) really good … and it worked. So, my understanding was, it was looking at ways … we could improve. Participant 6, district nurse leader

Empowerment

Some participants reported that they felt that the improvement methodology helped to create an environment where they felt empowered to address PU harm, in a way that they had not been able to do so before, especially in terms of sharing their own ideas.

> So, this is the first time that I've been able to adapt things onto the ward and come up with some new ideas. The collaborative was put there, so that different skill mixes of staff were able to come up with ideas and discuss them with other teams. Participant 1, acute ward manager

The collaborative helped to provide teams direction and guidance on the gaps that required improvement for each team and where to start and also improvements that were happening and requiring scaling up.

> We could address the problems, (for example,) where education is needed, where training was needed. Where perhaps we were doing things that weren't great and where we were doing things that were great and improving in those areas. Participant 5, charge nurse

When asked if the improvement would be sustained, most participants agreed that it would continue following the collaborative end, but that staff would continuously need a 'push' to ensure this.

> Without that push, we probably would have just stopped and not looked at all the things. So, in a way, at the start line, you're like, I'm sorry, we've done our bit, go away. But it was good. It was like, come on, you can do another. So, we kept going. Participant 6, community team leader

Participants felt that it would be possible to continue the improvement work they had started.

> All the things that we've put in place, there's no reason why we can't continue doing what we're doing. Participant 5, charge nurse

Barriers to engagement

The majority of participants (n=5) reported that they were not initially engaged with the collaborative. One of the reasons reported for this was the initial email introduction, which participants felt did not explain the collaborative and its benefits well. It was felt that this initial

introduction affected the perception and motivation of the participants.

> I think the email itself wasn't enticing. It was just anybody that wants to be involved can be. Participant 1, acute ward manager

Another barrier was staff workload, and at the beginning of the collaborative staff felt reluctant to be involved because of the amount of additional work they perceived the collaborative would entail.

> Before … (the start of the collaborative), I was very much, what more do you (the Trust) want us to do. How can we possibly do anymore? We are on our knees, day in, day out, slogging away, these patients don't listen to us. We can't do anything. What do you want us to do? (I was a) very negative mood hoover (a person demonstrating negative traits that can transfer to others). Participant 6, community team leader

However, as the participant learnt more about the collaborative process, they felt that involvement with the collaborative did not negatively impact their workload, and actually reduced their workload. The participant said that if they had understood the collaborative better in the initial stages, they would have been more passionate about joining it.

> Would I have put my hand up (to be involved in the beginning? Probably not, because I'd have thought we're too busy. We're not going to make any difference, so why are we even bothering. Now, when I know what it's all about and that we've made a difference, would I, yes, absolutely. Participant 6, community team manager

While most participants directly involved in the collaborative became increasingly engaged throughout its duration, they found it difficult to engage other members of the wider clinical team into the collaborative work.

> I just wish there would be more people onboard. I just wish someone could teach me how to get people to be engaged. Yes, that's the biggest problem is getting people to engage. Participant 2, community nurse

Impact of COVID-19 on engagement

The impact of COVID-19 was more significant in some areas on patients and staffing and the collaborative success than others.

> Well one it increased the numbers of PUs to start with, because the patients were so very ill. They were bed bound, whereas normally you've got rehab patients that you're getting them out of beds. … So, you've got the whole physical aspect of Covid that affected them. But you've also got the fact that instead of having ten or eleven staff on, you had seven on. You'd have one qualified with an agency if you were lucky, or the ward manager who's no patient contact, having to work on the ward. Participant 4, acute ward manager

Particularly in an area where their patient specialty changed due to COVID-19.

> Our first (barrier) … was Covid. That changed our whole patient dynamics, and we ended up with a different speciality to orthopaedics. Also staffing, we were all affected by Covid. The three leads for the collaborative all ended up having to have time off. (The collaborative work) sometimes did slip a little. Participant 3, charge nurse

Participants additionally felt that COVID-19 impacted and influenced attendance of the QI methodology sessions.

> I would have liked it better if I've been able to attend the theoretical parts of the course, because I only managed to get to one session, because we were so busy with being on the Covid ward and everything. It's just been so busy with being shorthanded and everything. Participant 4, acute ward manager

Even though the teams attended and were engaged there was an awareness that COVID-19 was a central factor throughout the collaborative.

> Everything has been focussed around Covid. Participant 4, acute ward manager

The collaborative was also identified a positive distraction from the COVID-19 pandemic.

> I don't think to be fair it effected the- I mean obviously Covid has been a nightmare as we know, but it also gave us something else to focus on, because everything is just Covid, Covid, Covid. So, it did give us something else, like I say to focus on. Participant 6, community nurse manager

Participants also described they wanted to carry on with their improvement efforts despite COVID-19.

> I don't think it's affected it in any way, because we've adjusted, used Microsoft Teams We've had little problems- what's right word, hiccups, but we've just kept going. I think the way the whole NHS has functioned; I think we've just got on with it. I wouldn't say for one minute that anything has affected it, because we found another way to work haven't, we? Participant 2, community nurse

Coherence

Understanding need for PU improvement

All staff displayed an awareness of the need to reduce PUs, in both hospital and community settings. Staff were aware that it was a priority problem.

> We knew (that) we were getting PUs, but we weren't aware of the statistics…and how to make improvements…We were causing significant harm to patients, and nothing was really being done about it,

even though incidents were being put in (recorded). Participant 1, acute ward manager

There was also an understanding that this was PU reduction was a focus for the trust.

I think probably because it just put a spotlight and a highlight exactly on that at the time. Participant 4, acute ward manager

There were suggestions that perhaps the teams felt unsure about the purpose of the collaborative before it started.

I understand it now but not at first. For me, it's about trying to reduce (PU) harm, trying to find ways that we can reduce harm and looking at the different processes to help us reduce harm. So, I probably knew before I got there. Participant 6, community nurse manager

Understanding of collaborative

Prior to the collaborative teams were unsure of the collaborative purpose.

But after the first session, that was all obviously very clear to us what we'd be doing. Participant 1, acute ward manager

QI is formally developing within this trust, for some this was the first time they had been involved in QI.

Quality improvement has been a new thing, the way you're doing it, it's new isn't it. Participant 4, acute ward manager

Some members of phase II of the collaborative had been informed by previous teams of the reason for the collaborative and therefore had a greater understanding.

So, it was sold (to me) at a team leader meeting by a previous (collaborative) team member who said it was really good and worked. So, my understanding was, it was looking at ways of improvement, how we could improve. So, I actually went in thinking that you were going to tell us what to do and how to improve. Which would have been really quick, and we'd gone off and done that. Participant 6, community manager

PU reduction was not a new approach at this trust, but the use of a collaborative was a first for participants.

PU collaborative for us was obviously about reducing our PUs. The training and the implementation of. Participant 5, charge nurse

Other participants were approached by management to join the collaborative.

It was an email from (participant's senior nurse manager), who was our manager at the time. He was asking for four volunteers ... I think there had been …a rise in PUs in the hospital. So, I just said I'd do it because it was something interesting. Participant 1, acute ward manager

Understanding of quality improvement

It is suggested that a number of healthcare professionals had little or no experience in QI. A few answered 'none' when asked what experience they had (eg, Participant 3, charge nurse) and others reported minimal experience.

So, I didn't have a lot of experience with QI, this is one of the first collaboratives that I've actually done. Participant 1, acute ward manager

The fact that this was most participants' first QI collaborative programme meant that they were unsure of the difference between participating in a collaborative delivered during the pandemic compared with a standard collaborative programme.

Participants started to engage with the data and understand how this informed their tests of change.

Yes, I do and I'm not even going off looking at the figures, because even if the figures haven't dropped, I still think there's an improvement in awareness and processes and what we do. So even if the figures have only dropped by 10, I still think, do you know what, it doesn't matter, because what we're doing is more proactive, and we're looking at it in a better way. But I don't think you'll see true figure drops until they start attributing it differently, or what we've put in in place starts work in continuously. Participant 6, community team leader

Collective action

Actions to increase use of QI methods

There was an interest in learning more around QI methodology but not always the time to do this.

It wasn't always possible to get team members together outside the virtual sessions but when we did we enjoyed process mapping and using the QI tools. Participant 6, community manager

When participants grasped QI methodology, they were invested in scaling this up.

We involved (members of the team) in the process maps that we did or the PDSA cycles that we did when we made changes. So, we knew that they knew why we were doing it. We couldn't just keep coming up with the ideas for change we needed them to help us as well. Participant 5, charge nurse

Actions taken to scale up improvements

Participants were motivated to scale up improvement and the profile of the collaborative through different channels of communication.

So, it's brought more in the safety huddles to say what the new ideas were and how we're going to implement them, and what we need to change on the ward. The more that we spoke about it, the better the idea got and the more people are educated on PUs. Participant 1, acute ward manager

> We had a newsletter; at safety huddle we were discussing that this is what we were doing. Obviously involve the team if there's any changes, asking them for any ideas as well. So, we tried to engage them as much as possible, so that we weren't just coming in saying, this is what we're doing. By involving them so everyone is part of the whole collaborative, not just the people that were on it. Participant 6, community team leader

> We brought it up in the safety huddle in the morning, so we'd bring it up for the week and it would be a topic that would speak about each morning in the handover. We'd say we've got this new idea for the PU collaborative. This is what we're doing. Could you try out using the grab bag and give me some feedback on it at the end of the week. Then that's what the team would do. Participant 1, acute ward manager

Monitoring what other teams are doing for learning purposes

There were several teams who completed phase I of the collaborative and shared their learning and tests of change with the next phase of the collaborative in learning sessions and on visits to clinical areas where possible.

> She's coming to see what I do. But I'll be saying to her that I've done this with the help of the PU collaborative. This is how I've done all this. Participant 2, community nurse

> Phase two were their buddy. So, they've come to us to ask for advice or the ways that we've done things that we could have advise on. Participant 3, charge nurse

Other teams did not meet with their buddy teams out of the collaborative session.

> Not directly, but obviously when we do the Teams calls the other collaboratives are on there as well. So, it's good to hear what other areas were doing, that we could potentially use as well. Participant 2, community nurse

> We looked at it from a different angle. We looked at stakeholders, as I mentioned before, and who else is involved apart from the staff within the ward. So then looked at the porters and the suppliers. Participant 3, charge nurse

Reflexive monitoring

Understanding and reviewing data

There were some early adopters within the collaborative who really embraced the use of data.

> I thought the statistics were really good. The graphs were really good. It certainly showed me things in a different light. I actually looked at, oh, my God, what's happened there. What time period was that, why is it that we've not had damage for four weeks, but we're now getting damage. It made me as a manager look at the staffing levels, the acuity of the patients, the type of patients that we had. I'm starting to look more to the answers, rather than just answering incidents, kind of blinded. So, I was looking at the bigger picture, basically of what was happening around that time period for things to have deteriorated, to see if there was anything else that contributed to pressure damage. Participant 1, acute ward manager

Others felt the data was difficult to understand and not explained fully.

> The data just came to us with no explanations or anything. So, when I first saw it, I actually thought, oh no, I've not seen all this pressure damage, it's a bit high. But then I realised it was good, it was how many days between. I think a brief explanation of it would been helpful. Participant 4, acute ward manager

It was clear that the data did drive improvement in some areas.

> It was really, really encouraging, because it meant that the work that we were doing, we were clearly getting results each week. For every week that we didn't get damage it was like, yes, another week down…It was good, really encouraging. Participant 1, acute hospital manager

There were also members of the collaborative who felt the data was condescending when comparing data to other acute areas.

> When I looked at- I don't know Ward XX data (a different ward with less PUs), I was like, oh, whoopie for you. You've only had seven, come out in the real world. Come on…take your shoes off and get your trainers on and come and do an… eight-hour shift with 17 patients (in the community) …So, that that didn't work for me. Participant 6, community team leader

Despite concerns about the data being used for comparison, the participants did find the data useful for improvement, especially when focusing on their own data only.

> Yes, I like the numbers (weekly data), both (SPC and time between charts) I think are useful, if you can say to your team, right, we've had in the last month or the last two months, we've had five recorded pressure damages attributed to us. But that's seven weeks in between (last recorded PU). Before that, it was only seven days (since the last PU). Participant 6, community team leader

Discussion

This evaluation found that overall staff reported that they could feel the improvements in culture and a reduction in PU. The improvements that staff reported aligned with the improvements presented in data charts (see online supplemental file 4), which have been sustained over time. This suggests that the use of QI frameworks, such as the BTS collaborative model, can help to achieve

improvements in a systematic way, that involves frontline staff. Although some frontline staff may display less cognitive participation (engagement) with the collaborative at first, if they develop (coherence) of the long-term benefits of the collaborative and most importantly understanding of QI methods, engagement can improve. Not only can the use of QI help to reduce harm but staff feel QI is useful to help with saving time 'I thought we were too busy for this but in the end this saved time spent when a patient has a PU' (Participant 1 acute ward manager), which is particularly important at a time where many healthcare staff are reporting that they are 'burnt-out'.[14]

Empowering staff to use QI to reduce harm can have a knock-on effect, as staff felt the 'more that we spoke about it, the better the idea got, and the more people are educated on PUs' (Participant 1, acute manager). This highlighted that collective action to scale up interventions and improvements greatly impacted engagement.

In terms of reflexive monitoring, particularly reviewing data, teams found reviewing their own data useful but found comparison to other wards frustrating, especially when their team had more patients and certain patients had more complex needs.

As this was the trust's first QI collaborative, it is difficult to know the impact of the COVID-19 pandemic on engagement, as it is not possible to compare to previous non-virtual collaboratives. However, the perspectives of participants highlight the resilience demonstrated by NHS staff when faced with difficulties[15] and how staff often feel they have to 'adjust' and 'find another way to work' (Participant 2, community wound healing nurse).

To the best of our knowledge, this is one of the first studies that has evaluated a BTS collaborative jointly focusing on PU reduction in both community and acute hospital settings. This is important for the UK as healthcare organisations move towards a more integrated care system approach in 2022[16] and because PUs can develop in any setting and become more severe as patients transfer between settings.

The results from this evaluation highlighted that it was not possible to explore the impact of the COVID-19 pandemic on participants, as the data made it apparent that this was the first QI collaborative participants had taken part in. However, since this evaluation was done, the adaptations made to the programme due to the pandemic have now reverted to original plans for collaborative programmes undertaken by the trust. For example, collaborative learning sessions are no longer virtual. Further work has been undertaken to explore the difference between the collaboratives that have used more virtual sessions and coaching and those that have relied more on face-to-face sessions and coaching. Early results highlight that face-to-face sessions are preferred. For example, a community district nurse who has been involved in the PU QI collaborative during the pandemic, has now also been involved in a standard face-to-face learning sessions while partaking in a programme that has focused on improving end of life care, she has stated that:

> Covid was a complete barrier to the way we met as a group during the collaborative. Face-to-face learning sessions are far more enjoyable, meeting all these different people and networking and seeing all the different services. The pressure ulcers collaborative virtually was good at the time, we had some positive results. Although we had no other way of meeting other than teams. Now I have been involved in a face-to-face collaborative I can see the added benefits (personal communication with Community Matron participating in a quality improvement programme in 2023).

In both acute and community settings, participants generally agreed that it was appropriate to continue work around reducing PUs during the COVID-19 pandemic and that work related to reducing PUs should not be stopped under any circumstances. It was a successful initiative as PU's went down, from the beginning of the collaborative. This can be seen in chart 1 and 2 (online supplemental file 4). Chart 1 identifies the number of PUs in the community setting, showing a significant reduction. The mean average at the start of phase I was 10 PU's per week this has reduced to 5.5 PU's per week which is a 45% reduction. Chart 2, a time between chart, which shows an increase in the days between events of PU's grade 3 and 4. The time between has increased from 20.5 days to 64.3 days. As participants discussed this showed the importance of continuing the collaborative during a pandemic. Some staff even felt that the collaborative allowed them to have a 'break' from the pressures of the pandemic while continuing to care for patients, as during the height of the pandemic everything was 'just Covid, Covid, Covid' (Participant 5, acute nurse).

The majority of staff were aware that preventing PUs was a big priority in terms of harm reduction in their area. However, they were not necessarily aware of the magnitude of the problem in terms of how many PUs a week were being reported. By understanding the magnitude of the problem, and understanding their PU data, frontline staff reported feeling more empowered to reduce harm from PUs and most importantly, they know that their efforts are leading to improvements.

By simply receiving their data on a continuous basis, they reported that they had a new 'energy' to try even harder in terms of reducing PUs. Celebrating successes was reported as big contributor for continuing this energy, particularly celebrating weeks where no PUs were reported as a 'another week down', (Participant 1, acute ward manager) which made teams think 'Let's do it next week' again (Participant 6, community team leader).

The collaborative approach helped teams to learn about and spread improvements without disrupting clinical care in the way taking an entire team away from care would do. Even though only a few members of the team (three to four) attended learning sessions, learning was

disseminated through individual team communications, such as safety huddles. This is particularly important at a time when staffing levels and agency staffing levels were at an all-time low.[17]

Empowering staff with their data helped them to see the 'bigger picture' and take ownership of PUs and understand what was leading to them, including looking at the bigger picture, of what was happening around that time period for things to have deteriorated and investigate if there was anything else that contributed to PU's.

Awareness and understanding of the number of PUs patients in areas were having, acted as a call to action and motivated teams to have greater ownership and understanding of improving PUs.

Staff need comprehensive and clear systems for defining and measuring PUs, before they are able to reduce PUs. While comprehensive guidance has been published in recent years to help with the measurement and definition of PUs. Support is needed to ensure frontline staff understand this, and to support with individual problems that arise due to context. Consideration of context is particularly important for community settings, that have greater variance in systems, such as ordering of PUs prevention equipment.

The collaborative approach was new to this trust, so it was difficult for participants to fully acknowledge the difference between a virtual collaborative compared with non-virtual collaboratives.

The required QI coaching that took place during the action periods, in-between the learning session was significantly more due to the reduced time allocated to the virtual learning sessions. The improvement coaches were limited to the coaching they achieved with teams due to the lack of face-to-face contact and staff finding it difficult to allocate time to meet as a result of patient acuity due to COVID-19.

Strengths and limitations

People who participated in the collaborative have completed the evaluation which may introduce bias, but for the purpose of improving, this has helped to make improvements for phase III of the collaborative and understand staff perspectives.

The pandemic and access to staff working clinically did affect the number of interviews conducted. We did feel that overall saturation had been achieved.

The data collection prior to the collaborative may not have been as accurate due to flaws in the PU reporting and validation process. The process improved over time this was seen as a real challenge to nursing teams as some of the PU's appearing in original data sets did not always accurately report PU's, this was frustrating for nursing teams and highlighted the need for an accurate process with less room for error. Details of the process map prior and following phase I of the collaborative can be seen online supplemental file 3, the improved process was not only less time-consuming but reduced duplications and over-reporting which had been a known issue prior to the collaborative start. Improving the PU reporting and validation process within itself has been a strength of the collaborative, and despite data inaccuracies, this study highlights that frontline staff felt the improvements happening.

Nursing management staff were generally supernumerary (not counted in clinical numbers) to patient care giving them more availability for meetings and interviews. Therefore, they were more likely to be selected for interviews.

The BTS model was new to this trust although some of the collaborative team and expert faculty had previous experience with the BTS model.

Conclusion

The BTS model can be useful for successfully reducing PU harm in a structured way. All participants felt that the approach was useful, despite the adaptations made to the delivery method due to the pandemic. Once frontline staff developed their QI capability, they became more enthusiastic, which led to making QI part of everyday practice. Once staff started to see improvements in their data, this created an impetus to try even harder to improve. To support staff to make improvements, it is vital to ensure systems such as data collection are accurate and timely. Furthermore, raising awareness of harms data, is key to ensure that they take ownership of improving harms. When staff understand QI, it helps them to execute their own ideas on how to improve practice. This study highlights the importance of healthcare organisations building strong foundations for QI. Once frontline staff have a good knowledge of QI, improvements can happen at a much faster pace.

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Contributors AD: Programme Lead, led on facilitation of sessions, conducted all interviews with support from ultimate author, led on analysis of data, conceptualisation of study, drafting article, editing based on coauthor contributions. AD will act as guarantor. KG: Conceptualisation of programme, led on delivery of programme, led on facilitation of sessions, conceptualisation of study, drafting, review and editing of paper. PM: Conceptualisation of programme, executive

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Patient consent for publication Not applicable.

Ethics approval This study was identified as service evaluation with support of the organisations research unit as it did not involve changes to treatment or patients. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article or uploaded as supplementary information.

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Interview Schedule

An Interview study formatively evaluating the implementation of the Eliminating Pressure Ulcer collaborative and related improvements
Approximate Interview Schedule

Questions may be adapted through-out data collection. This interview schedule has been developed based on Normalisation Process Theory and findings from previous research about implementing Collaboratives to improve practice.

Background details of participant(s):
Tell me a bit about yourself (name, role, team, how long have you worked in the NHS & experience of QI before the collaborative if any)?

(Coherence) Understanding of the eliminating pressure ulcer collaborative and why it was developed.
In your view, what is the Pressure Ulcer Collaborative?
What are the associated aims? Are you aware what of the aim of the collaborative was?
Do you feel it was needed?
What is the problem that the collaborative is trying to address?
Do you feel the collaborative has helped towards these aims/ solving these problems?
Were you involved with any other work to help reduce Pressure Ulcers, prior to the collaborative? If so what was this?
How was the collaborative different?

(Cognitive Participation) Engagement with the Collaborative
How did you get involved with Pressure Ulcer Collaborative?
Do you know why your team was chosen to participate?
What do you think about how teams were asked to participate?
How did you hear about the pressure ulcer collaborative?
Were you happy to be involved initially?
Did you understand what was expected of you before you started?
What support and information did you get about the collaborative prior to its start?
Did you find the support and information helpful?

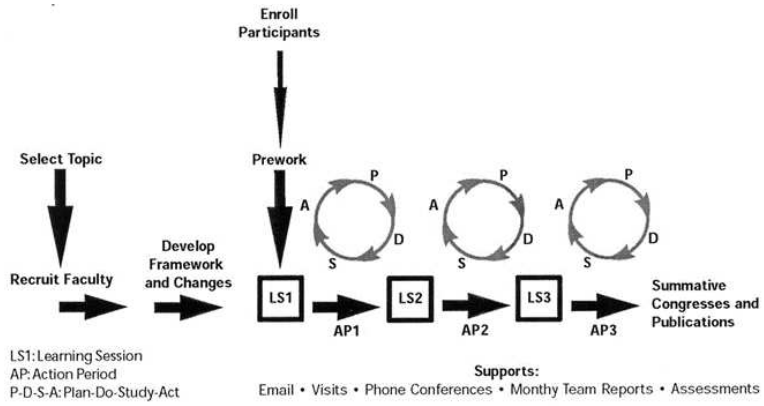
(Collective action) Scale-up the collaborative and associated improvements
Do you know much about the other phases of the collaborative?
What was the awareness of the collaborative like within your team?
What actions did you or your team take to increase awareness?
Were people interested in the collaborative able to get involved?
How did improvement activities get scaled up within your team?
Did you contact or work with any other teams? Phase 1 and Phase 2

(Reflexive monitoring) Reviewing associated improvements, sustainability of them and Pressure Ulcer data
Do you feel you have seen any improvements since participating in the collaborative?
Where there any challenges during the collaborative process?
How did the pandemic affect the collaborative process?
Do you think your improvement will be sustained?
Any ideas about what would be needed to help them be sustained? (facilitators)
What would cause the improvements not to be sustained? (barriers)
Is there anything you would you change about the Collaborative?
Apart from this interview, have you managed to give any other feedback about your involvement in the collaborative?
Do you enjoy reviewing the weekly team data?
Specific questions about teams' data and special cause variation

Anything else you would like to discuss?

Supplementary File 2

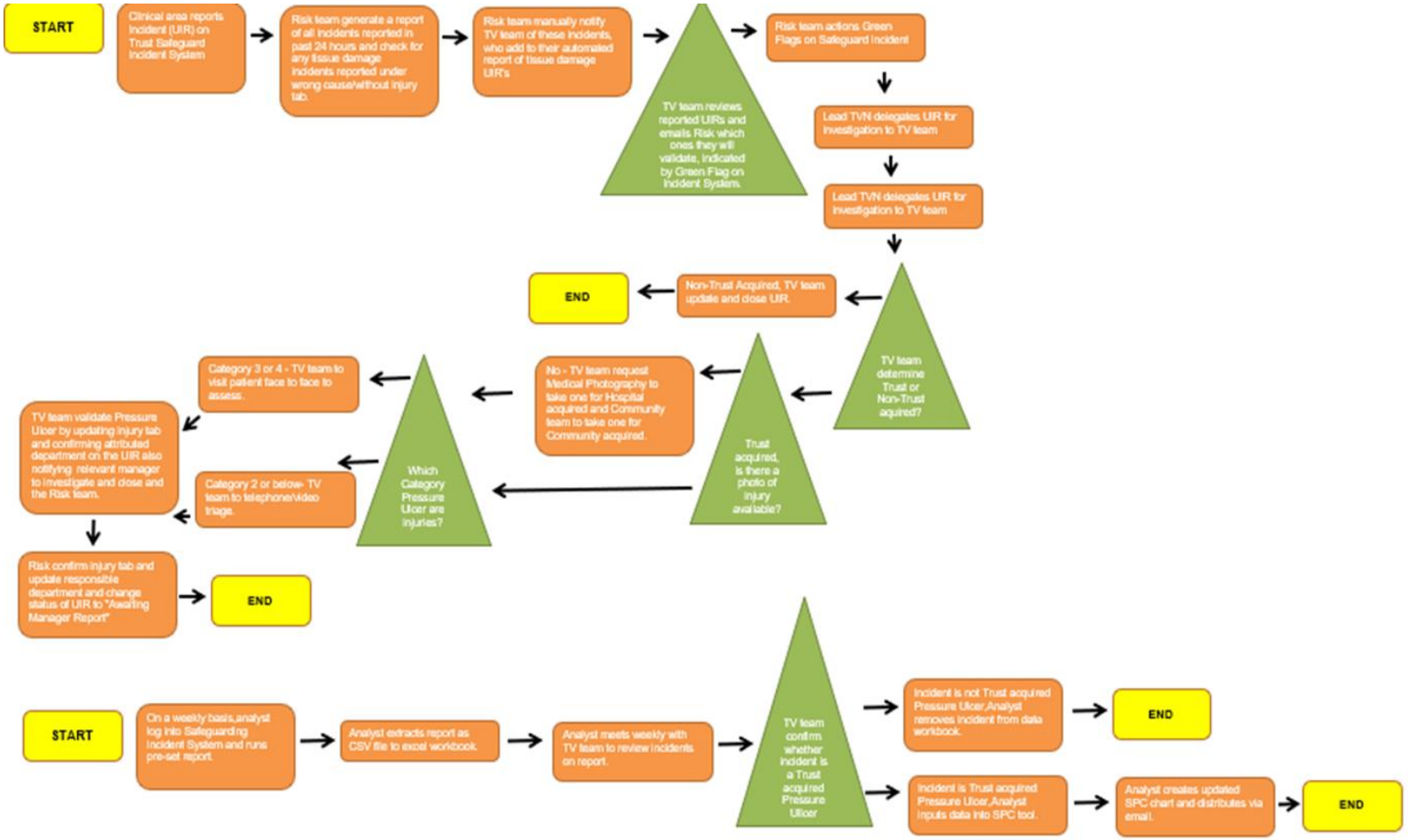
Institute for Healthcare Improvement BTS model.



IHIBreakthroughSerieswhitepaper2003 (4).pdf

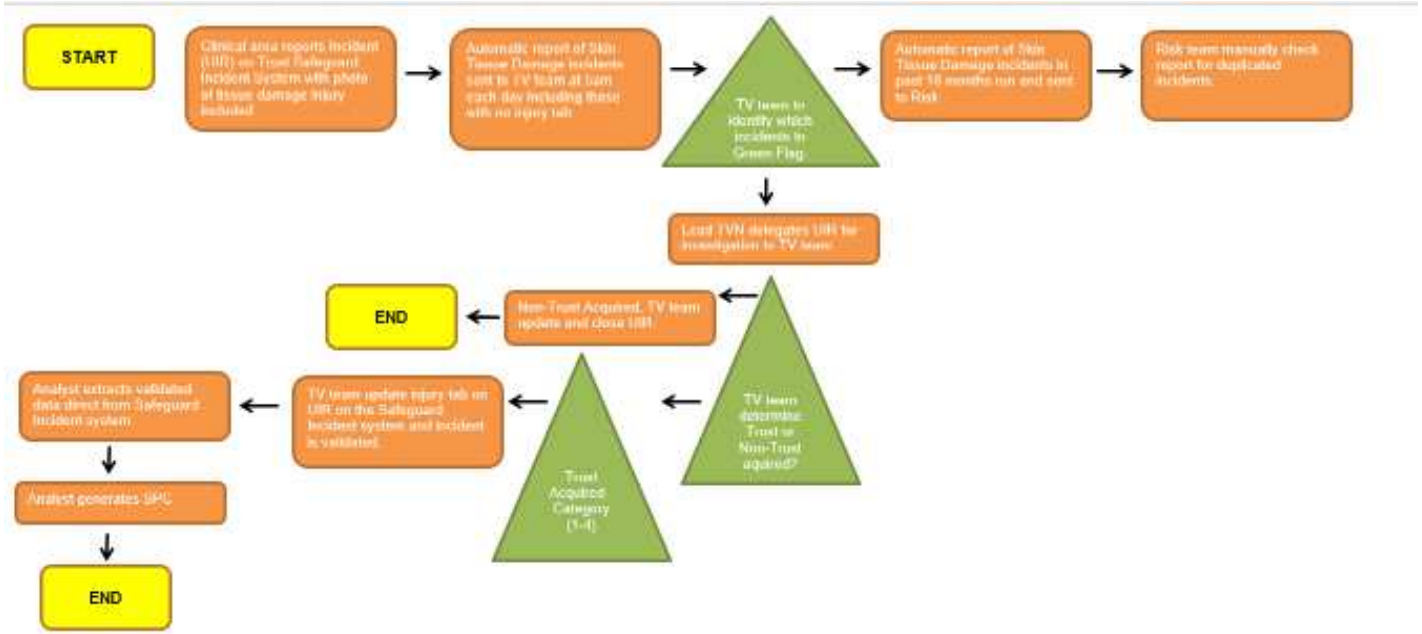
Supplementary File 3

Original Validation process of pressure ulcers in the acute and community setting.



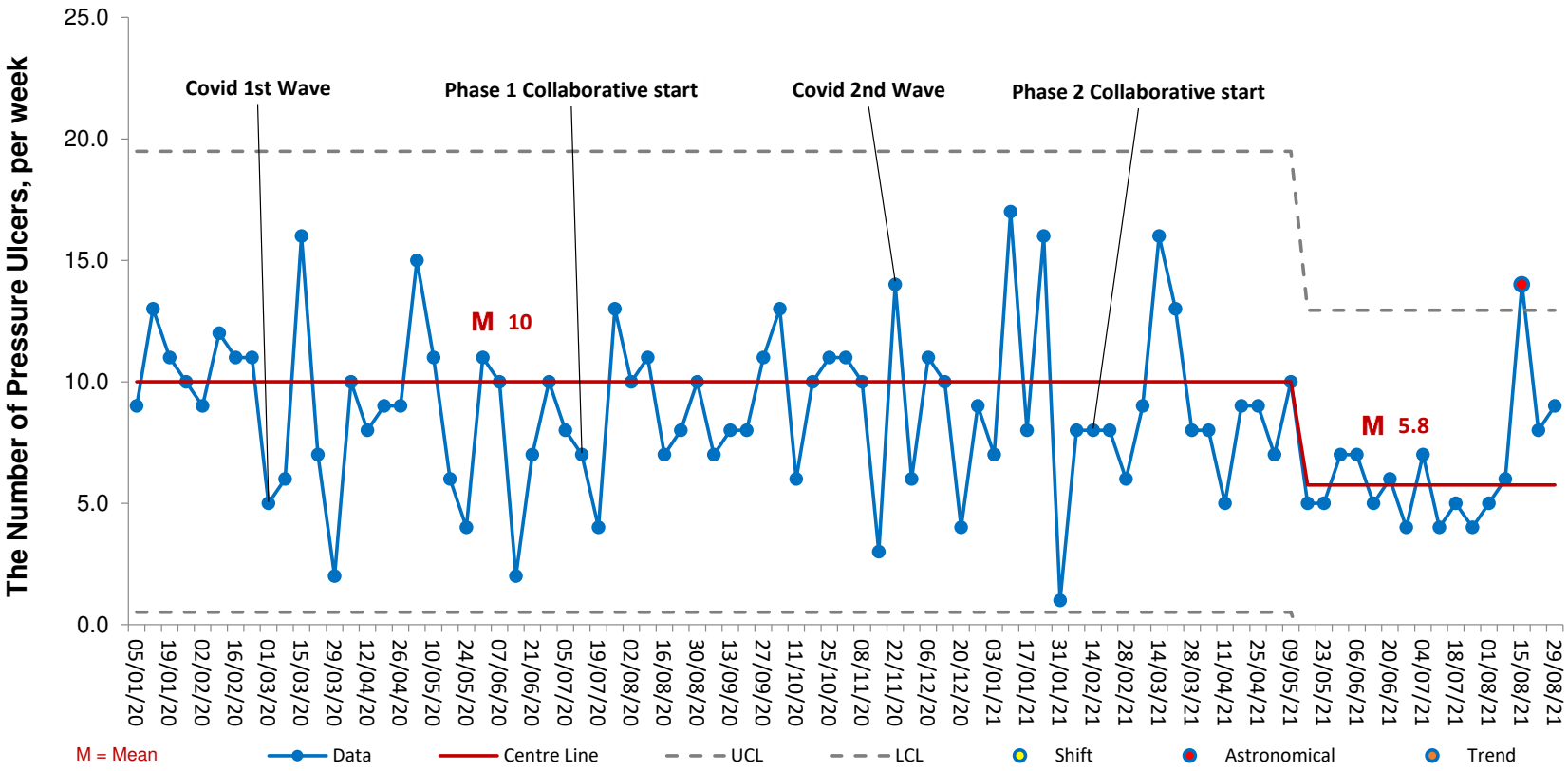
Supplementary File 3

Validation process of pressure ulcers following phase 1 collaborative



Supplementary File 4

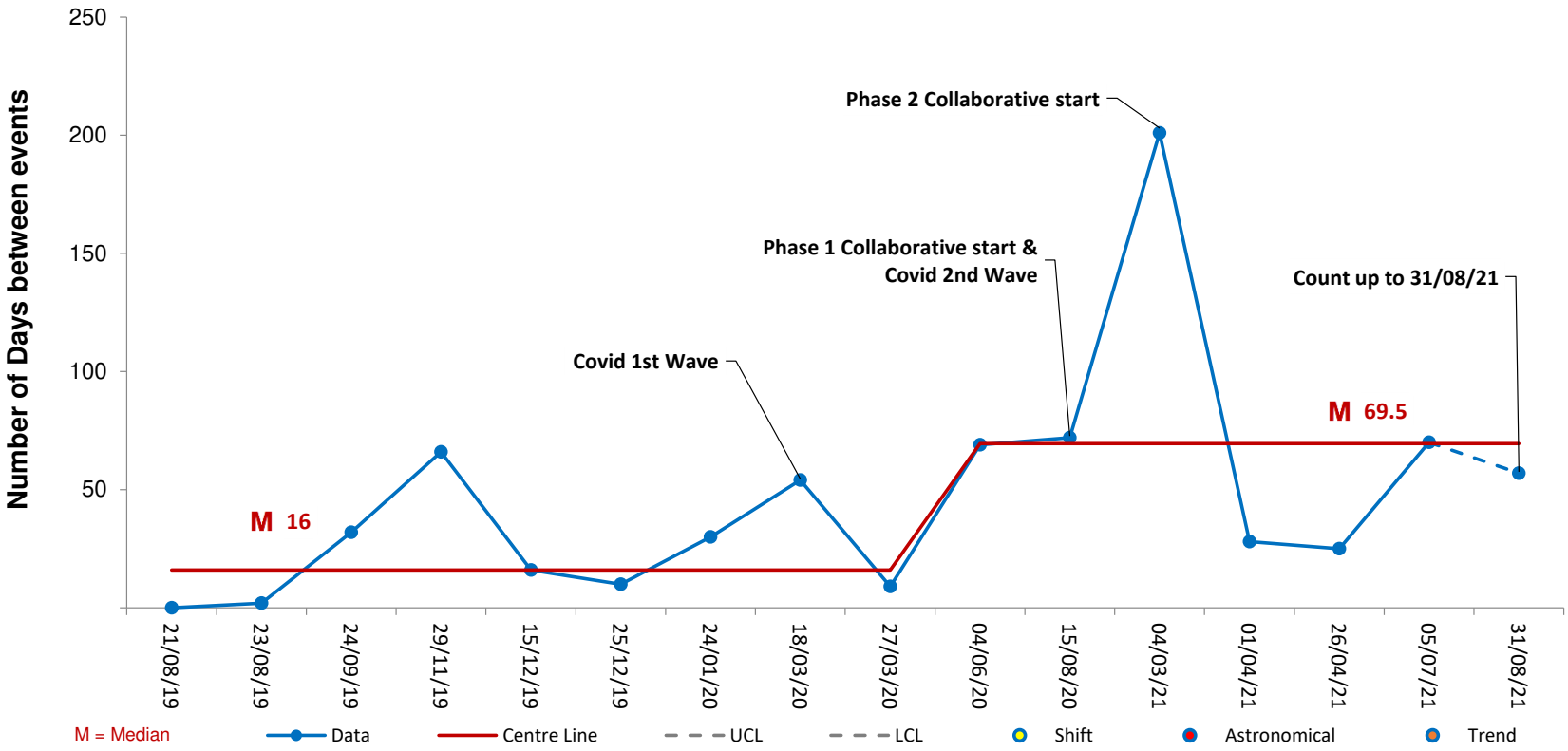
Chart 1 – Count type (C) chart to show the number of Category 2-4 pressure ulcers per week, within community teams participating in the collaborative between (January 2020 – August 2021)



Supplementary File 4

Supplementary File 4

Chart 2 – Run chart to show the time between (in days) Category 3 & 4 Pressure Ulcers, within acute teams participating in the collaborative, during the baseline period and Phase I and II of the collaborative (August 2019 – August 2021)



Supplementary File 4