



## SUSQI PROJECT REPORT

**Project Title: Reducing Waste associated with Infliximab Infusion Bags**

**Start date of Project: 2/10/24**

**Date of Report: 06/12/24**



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## Background:

Medicines waste is recognised locally and globally as both a financial and environmental issue. It is estimated that the cost of medicines wasted prescribed within the NHS amounts to £300 million annually (Hazell and Robson, 2015). During a national NHS call for ideas to reduce environmental impact, only 6.7% of submissions were from a medicines workstream perspective. This is despite medicines contributing 25% of the NHS carbon footprint making it a high priority area for NHS sustainability initiatives. (NHS England, 2022). The RUH climate strategy aims to drive down carbon emissions that are within their direct control to net zero by 2030; emissions related to the value chain upstream or downstream of trust-based activities i.e. cold chain transport for aseptic products prior to receipt are not included (RUH, 2020). Reducing medicines waste is a crucial driver in meeting this target and a key part of the Royal Pharmaceutical Society (RPS) Medicines Optimisation Agenda (RPS, unknown). This project explores the possibility of reducing waste associated with a specific high-cost biologic medicine - Infliximab.

Available literature focuses on the impact of dose-banding as a strategy to reduce waste (Yousif et al., 2014; Nisar, 2018). This practice is already implemented at the RUH. No published material could be found specifically relating to the processes of prescribing, screening, manufacturing and administering biologic drugs.

The RUH is a district general hospital that provides services to a population of around 500,000 people in Bath, North East Somerset and Wiltshire. Within the trust, infliximab infusion bags are primarily used by gastroenterology to treat inflammatory bowel disease (IBD), with additional use in rheumatology for the treatment of rheumatoid arthritis. The use and relevance of infliximab in treatment is supported by several NICE Technology Appraisals. Use is also guided by local formulary decisions (Oliver and Craine, 2019) and is safeguarded via the use of BlueTeq (an electronic management and authorisation system used within the NHS for financial governance, data collection and reimbursement standardisation of high-cost drugs). For the scope of this project, the clinical decision to prescribe infliximab was assumed appropriate.

These infliximab infusion bags are generally manufactured onsite at the RUH in the Aseptic Services Unit (ASU) using infliximab vials. The ASU is not licensed and so manufactured bags have a 7-day expiry as per Section 10 of the Medicines Act 1968. The number of patients treated each year using infliximab infusion bags manufactured on site at the RUH for IBD and RA is 576 and 90 respectively. In financial year 2023/2024, the Trust disposed of 76 infliximab infusion bags totaling 373 vials of biologic wasted. The production of an average Infliximab bag is estimated to be 164.85 kgCO<sub>2</sub>e. This represents 11% of all infliximab bags made on site. When infliximab bags are disposed of without being administered to a patient, there is both material and resource waste, and therapeutic loss. There are financial and sustainability implications as the manufactured products require several ancillaries per vial which are then wasted. Historically, these biologics have not been returned as they are



refrigerated items and the ASU was concerned about storage conditions. However, we now have EasyLog fridge monitoring as well as manual monitoring by the nurses on the BDU. This means we can track the temperature of the fridge retrospectively and have assurance that the product is safe for reuse. From the point of a prescription for infliximab being written, to administration to a patient is a complex process that involves many steps and professionals.

From the project outset there was stakeholder engagement across the teams who would be affected by change, with co-production of solutions. Stakeholders involved included staff from the ASU who manufacture the infliximab, staff from the Biologics Day Unit (BDU) where the infliximab is administered, prescribers from the IBD team, the biologics specialist pharmacy technician, the lead pharmacist for research, a senior education & training pharmacist and patients who receive infliximab infusions. Their insight was vital to ensure the feasibility of interventions.

There are similar initiatives nationwide that result in reduced waste of biologic products. However, their processes vary and the context is generally in larger NHS trusts. The position of the RUH as a district general means that those in a more similar context may be able to replicate any positive changes made more feasibly.

#### Specific Aims:

Having discovered in the 23/24 financial year that 11% of infliximab infusion bags are discarded unused, this project aimed to reduce waste of infliximab infusion bags by 30% by June 2025.

#### Methods:

Data was gathered to identify the number of bags manufactured and the number of bags discarded unused between January and September 2024. Initial stakeholders were identified who were involved in the process from need for therapy to infliximab administration. All teams came together for a bi-weekly meeting with Centre for Sustainable Healthcare for additional guidance and carbon foot printing advice. Networks identified organisations within the UK who have policies in place to reduce biologic waste. A review of current legislation and professional guidance related to aseptic manufacturing and single-patient product use was undertaken (Human Medicines Regulations, 2012; Medicines Act, 1968; Specialist Pharmacy Services, 2023; RPS, 2016; EudraLex, 2011). The focus was on infliximab administered on the BDU. The stakeholder group collaborated to produce a process map which described all stages from prescribing to administration of infliximab (Appendix 1)). This was amended several times during the project as differing professionals provided new insight and expertise. It was used to identify ecological, social and financial costs. As a result of further discussion, a driver diagram was then produced (Appendix 2).

*The process map identified 2 key intervention areas:*

- 1) Reduction of patient non-attendance*
- 2) Reuse of unused pre-manufactured product*

#### Reduction of patient non-adherence

Sixty four patients for whom bags had been wasted between January and September 2024 were identified. Relevant data was combined from a patient telephone questionnaire and electronic prescribing records to understand reasons for non-attendance (Appendix 3). These reasons included non-attendance due to infection, general illness, COVID, patient forgetfulness, hospital admission, unawareness of appointment or 'other'. The most common defined reason for non-attendance was infection at 31%. No patients were found to have not attended due to forgetting the appointment or being unaware of the appointment. Waste due to non-attendance was categorized into 'avoidable' or 'non-avoidable'. Avoidable was defined as when the reason for cancellation was known before the bag was manufactured. This accounted for 45% (17) bags wasted. This illustrated a communication gap between appointment cancellation and bag manufacture.

The reason for cancellation was not documented in 56% of cases on the current electronic systems that are used by staff involved in the process. It was also found that 59% of patients were unaware that the unused infliximab bag would be discarded if they could not attend.

Data collection took several weeks due to workforce pressures and patient availability. Due to the time constraints of the project, options for intervention were simultaneously explored during data collection. The data collected did not show us that patients forgetting their appointment or attending inappropriately was a significant issue. If it transpired in further data collection that this was a contributing factor, the transformation team are open to exploring the possibility of changing operational processes. However, we do not currently have justification as to continuing to explore such a labour-intensive and large-scale intervention currently.

As a result of data gathering, it was observed that insufficient communication between clinicians and BDU/ASU/pharmacy were contributing to waste. This was not initially identified as a key area for intervention, although emerged as an area of focus when data-driven improvement was considered.

Several opportunities for interventions were discussed (Table 1).

	Pros	Cons
<p>Dr Doctor</p> <ul style="list-style-type: none"> <li>- A text messaging service to remind patients of their appointment or ask them to confirm attendance</li> </ul>	<p>Involvement of the outpatient transformation team</p> <p>Enhanced inclusivity e.g. ADHD and benefit of reminders</p> <p>Once implemented would be an automatic process</p> <p>Enhanced patient engagement</p>	<p>Current contracting did not cover the desired purpose in this project</p> <p>Inequal access for those without access to technology</p> <p>Accessibility issues</p> <p>Labour-intensive to implement</p> <p>Decreased effectiveness if network issues</p> <p>Privacy concerns of patients</p> <p>Could take months to implement</p>
<p>Patient-access logic forms on IT systems</p> <ul style="list-style-type: none"> <li>- A form sent to patients for completion several days ahead of their appointment to determine any potential reasons the appointment may need to be canceled or rescheduled</li> </ul>	<p>As above, additionally:</p> <p>Timely-decision making</p> <p>Standardisation of criteria for non-attendance</p> <p>Data can be used to audit</p>	<p>As above (except for contracting issues), additionally:</p> <p>Limited personal interaction, reducing the nuances that come from conversational consultations</p> <p>Potential for inaccuracies if patients misinterpret questions</p>
<p>IBD Patient Education</p> <ul style="list-style-type: none"> <li>- Production of educational material to be given to patients at IBD clinic appointments and a board to be displayed in BDU</li> </ul>	<p>Improved patient understanding and empowerment</p> <p>Enhanced patient engagement and shared decision-making</p>	<p>Lowest level of intervention effectiveness in literature</p> <p>Requires additional materials and staff time</p> <p>Consistency challenges in quality and depth of education</p> <p>IBC clinic happens infrequently compared to infusion frequency and so impact would be delayed</p>

<p>Millenium Pool</p> <ul style="list-style-type: none"> <li>- Use of an existing electronic system (Millenium) to centralise information shared between prescribing clinicians, BDU, pharmacy and ASU staff</li> </ul>	<p>Improved coordination and streamlined communication – reducing the potential for information to be missed No financial implementation costs Prompts standardisation of information gathering and sharing Can be implemented within a matter of weeks</p>	<p>Single point of failure should the system be disrupted Resistance to change</p>
<p>Sharing of Waste statistics with patients and Healthcare Professionals</p>	<p>Increased awareness and accountability – more informed decision-making Enhances patient engagement Prompts consideration of environmental impact Can be implemented within a matter of weeks</p>	<p>Data misinterpretation Potential to encourage appointment attendance due to feelings of guilt/ethical concerns</p>

**Table 1: Opportunities for intervention.**

A key learning point when interventions were explored, was the importance of early adoption of a system-wide approach. For example, the Dr Doctor text messaging system could be not implemented due to the operational decision to admit infliximab infusion patients as ‘day cases’ rather than ‘inpatients’. Had we not involved the outpatient transformation team in initial discussions, we may have focused efforts on this intervention which was less feasible than initially perceived. In hindsight, and with data to reflect upon, to enhance multi-disciplinary inclusion – it would have been beneficial to include gastroenterology and rheumatology consultants in the key stakeholder group as they make key clinical decisions about treatment initiation and continuation. They will now be engaged and updated via the weekly virtual biologic clinic (VBIC) meetings.

Current efforts are being focused on making a change related to the communication between prescribing clinicians and those later on in the process. The BDU team is creating a Pool on Millenium. Once this is in place, formal communication will be sent out to all teams via email and the process explained at relevant departmental meetings. It is perceived that there may be some resistance from the prescribing clinicians and so this intervention is likely to be introduced alongside sharing of waste statistics. This is to promote motivation

for change and increase accountability. It is hoped that making an intervention earlier on in the process will have the greatest impact on reducing waste.

#### Reuse of unused manufactured product

Kings College Hospitals London (KCH) have a Standard Operating Procedure on reducing biologics waste via aseptic returns. This was used as a means of information gathering and a formal meeting set up with the authors to discuss any potential challenges and solutions regarding the aims of the project. They were supportive and encouraging regarding the feasibility of the project. The process at KCH permits infliximab bags manufactured on-site for individual patients, to be returned to pharmacy and used for another patient should the intended patient be unable to receive the infusion. The main barrier for them was the intricacy of the returns process on the pharmacy stock management system. For this reason, the ASU team who would be returning stock at the RUH were asked to attend subsequent meetings. KCH stated there should be no issues with stability or integrity of the returned bag, permitting an inspection can be carried out by a qualified person and evidence of safe storage guaranteed as per other medicines typically return to a hospital pharmacy from internal departments. Their process was slightly different prior to implementation of returns to reduce waste, in that their prescriptions are often written only a day in advance and they manufacture on the same day as patients are due for their infusion. Aligning the processes at the RUH with KCH is possible but would require change on a larger scale that is currently outside the scope of this project and current workforce capacity.

Issues around rescheduling appointments are perceived to be contributing to infliximab waste. This is only relevant when the patient would be able to attend within the expiry of the infliximab bag. Although not directly addressed in the patient questionnaire, it was discovered that there were barriers to communication with the teams involved in cancelling or rescheduling appointments. At times this was due to a lack of patient awareness about how to communicate with hospital teams or an inability to get through on phonelines. This is an area of the project which requires more exploration and targeted data collection.

#### Measurement and Projected Outcomes:

##### ***Patient outcomes:***

Appropriate standard of care involves patients receiving their infliximab at the earliest clinically appropriate time. There may be legitimate clinical reasons, eg active infection, for delaying treatment but limiting non-clinical reasons for delay and improving early

communication regarding appropriate cancellation will contribute to optimised therapy with minimal waste.

Streamlining communication pathways around changes in the infliximab therapy schedule for all stakeholders using Millenium Pool should allow more efficient use of drug and “chair space” resource for patient benefit.

There are several NICE Technology Appraisals that support the use of infliximab in these patient groups. National guidance on infliximab use by gastroenterology and rheumatology will continue to be used as clinically appropriate. These interventions do not question or modify the clinical use or appropriateness of infliximab. The intervention should not impact care according to national guidance but unintended consequences will be monitored using the trust error reporting system and continual stakeholder meetings.

Impact will be measured through run charts monitoring:

- Wasted “chair space” and patient wait times to first infusion

#### Future work streams

Investigate further opportunity to reduce avoidable waste by use of digital solutions such as:

(a) Dr Doctor for patient reminders

(b) patient access logic forms for supporting decisions on appointment attendance and reducing unnecessary journeys

Investigate improving efficiency in rescheduling of already manufactured infusion bags from legitimate cancelled appointments, e.g. late cancellations for clinical reasons, prior to expiry. As well as reducing discarded bags, this may reduce patient anxiety over delayed treatment, improve maintenance of appropriate therapeutic drug levels and hence reduce the risk of disease relapse/associated symptoms and reduction in patient quality of life (Ben-Shatach et al., 2022; Li et al., 2022).

#### ***Population outcomes:***

Patient survey work has identified the use of text reminders 48 hours prior to appointments would help where there may be difficulties with scheduling, for example in ADHD, improving equal access to optimum care. Clarifying legitimate reasons for delaying therapy and providing easy patient access channels for communication reduces the patients burden of disease management and increases shared responsibility for care decisions. These digital

interventions will form part of future investigations but are currently out of scope due to IT limitations.

***Environmental sustainability:***

A hybrid methodology has been used to estimate the Green House Gas (GHG) emissions associated with making up an Infliximab bag.

GHG emissions associated with 50ml syringes, needles (19G), prep pads, and blue bag were taken from previous CSH projects where they had already been estimated using a bottom-up process-based approach. The analysis included GHG emissions associated with raw material extraction, transport and disposal.

GHG emissions associated with computer usage was estimated based on average consumption of a standard computer (150W) and multiplied by the time spent per activity. Electricity consumption was converted into GHG emissions using the factor for the UK electricity grid taken from the [2024 UK Government Greenhouse Gas Conversion Factors database](#) (Department for Energy Security and Net Zero, 2024).

GHG emissions associated with non-sterile gloves and face masks were taken from [Rizan et al, 2021](#), and sterile gloves taken from [Jamal et al, 2021](#).

For the GHG emissions associated with the pharmaceutical (Remsima 100mg vial x4), 250ml infusion bag, and remaining consumables that we didn't already have a carbon footprint for (spikes, beard masks and hair nets), an Environmentally Extended Input Output Analysis (EEIOA) was undertaken. Individual item costs were provided by the project team and multiplied by the relevant sector conversion factors taken from the [2021 UK Government database by SIC code](#) (Department for Environment, Food and Rural Affairs, 2012).

The production of an average Infliximab bag is estimated to be 164.85 kgCO<sub>2</sub>e. Table 1 details the breakdown of GHG emissions per bag.

Table 1: GHG emissions per production of an average Infliximab bag

	<b>GHG emissions per average Infliximab bag (kgCO<sub>2</sub>e)</b>
<b>Computer usage ( 80 minutes)</b>	<b>0.06</b>
<b>Remsima (100mg vial x 4)</b>	<b>158.0</b>
<b>Consumables</b>	<b>6.76</b>
<b>Total</b>	<b>164.85</b>

Annual savings if achieve project goal of 30% reduction in 2023/24 quantity of wasted product (reduce waste from 76 to 53 bags) = **3,791.55 kg CO2e.**

This is equivalent to driving **11,172 km** in an average car

### ***Economic sustainability:***

#### **Implementation and maintenance costs**

##### Work package 1. Reduction of patient non-attendance

###### Implementation Costs

- IBD patient education – amend existing prior to next print run. 0.5 days IBD team.
- Millenium pool for pathway communication – zero, existing system
- Display waste statistics in BDU – staff time (BDU/aseptic team) 8 hours

###### Maintenance costs

- Adding information to millenium pool – all pathway members, minimal time input
- Updating waste information – staff time (who?) 1 hour monthly
- Data collection for run charts – staff time ASU and BDU 1 hour monthly

##### Work package 2. Reuse of unused pre-manufactured product

Still to be costed – likely impact on ASU and BDU staffing.

Impact will be measured through run charts monitoring (related to both environmental and cost measures):

- Wasted product (*infliximab infusion bags*)
- Avoidable/unavoidable waste (*avoidable = bag manufactured after information available, but not communicated, which suggests bag not required*)

#### **Potential Savings**

Financial data used for the project was obtained from the pharmacy procurement team and using the pharmacy stock management system.

Annual savings if achieve project goal of 30% reduction in 2023/24 quantity of wasted product (reduce waste from 76 to 53 bags) = **£6,674**

### ***Social sustainability:***

Late cancellation of infliximab infusion results in BDU 'chair space' wastage increasing waiting list time to treatment. Additional waste when a patient attends but infusion



unsuitable for clinical reasons includes wasted travel time and associated arrangements e.g. time off work, travel costs, associated care requirements. Further opportunities to predict unsuitability for infusion by patients and staff ahead of attendance will be investigated.

Exploratory survey data showed the majority of patients were extremely responsive and happy to engage in initiatives to improve systems and reduce waste. The benefit of infliximab therapy in improving quality of life is significant and so many patients saw their feedback as a means of contributing to improvement for the benefit of themselves and others.

There is an additional social cost of inefficient use of staff time when infusions are unsuitable to be used. If unnecessary production of infliximab bags was reduced, this will free up staff time to be allocated elsewhere which is better financially and for morale.

Once any changes have been implemented, patients and staff will be given feedback on impact and their views and further suggestions sought.

#### **Results: Await intervention implementation**

#### **Discussion:**

This project has illustrated the opportunity for potential financial and environmental benefits. Wide stakeholder engagement, co-production of solutions and a data driven approach to investigation has resulted in SMART objectives for implementation.

- Improve patient education on consequence of non-attendance or late communication regarding booked appointments
- Create a Millennium Pool function on existing systems and educate on use to improve communication in a dynamic patient pathway by multiple participants to avoid unnecessary production of infliximab product
- Openly communicate ongoing waste statistics to patients and staff to illustrate improvements and future interventions

#### **Barriers and Challenges encountered**

Initial change ideas focused on potential re-use of pre-manufactured infliximab product, however challenges included aseptic manufacture legal frameworks alongside complex scheduling and co-ordination. Changes to SOP and QA documentation, which minimise risk by ensuring product integrity and stability, and required Pharmacy Governance approval would use limited aseptic staff resource and be slow to implement. Focus shifted to digital communication strategies to optimise patient attendance but contracting arrangements of the Dr Doctor communication system made this difficult to implement.

Further analysis of data gathered on historical product wastage, however, uncovered failures in communication by staff involved in the prescribing to administration pathway which had resulted in 45% of avoidable waste. Co-production focusing on this aspect has resulted in the proposal of simple, low cost, feasible interventions.

Navigating different working patterns and pressures on multiple departments to co-ordinate meetings was a barrier to progress. Team members committed to flexibility and briefed representatives to ensure wide ranging insight and feedback. Comprehensive project support, information sharing and communication via email and Miro was supported throughout by the SusQI team.

Potential risks are minimal but include patient misinterpretation of a drive to reduce waste resulting in feelings of guilt if an appropriate cancellation is made. Re-iterating legitimate reasons for cancellation and patient safety as a priority are key to mitigation. The project team should also monitor to ensure no increase in unavailable infusion bags for attending patients resulting in delayed treatment.

#### Potential scalability

During FY23/24, 825 drugs (excluding infliximab) produced in the ASU were discarded, representing approximately 4% of all medicines manufactured. Insights from this project can help reduce waste and costs for other medicines produced on site, extending the project's scope beyond infliximab.

#### Conclusions:

This project has identified key opportunities for improvement supported by robust data which has been summarised in the production of an A3 (Appendix 4).

Key contributors to success:

- Wide multidisciplinary stakeholder engagement
- Methodical QI approach
- Project support via the CSH team maintaining momentum and providing mentorship
- Perseverance in identifying alternative change ideas when initial options unworkable

The project report and incorporated QI tools will support continued engagement to implement change and sustain improvements. Identifying a project lead is critical alongside securing senior leadership endorsement. Any system changes must be formalised to ensure resilience. Submission to the Trust R&D abstract competition will support dissemination potentially via conference submission. Finally, if tested changes are seen to be beneficial, support to scale up across on-site aseptic medicines manufacture must be secured.

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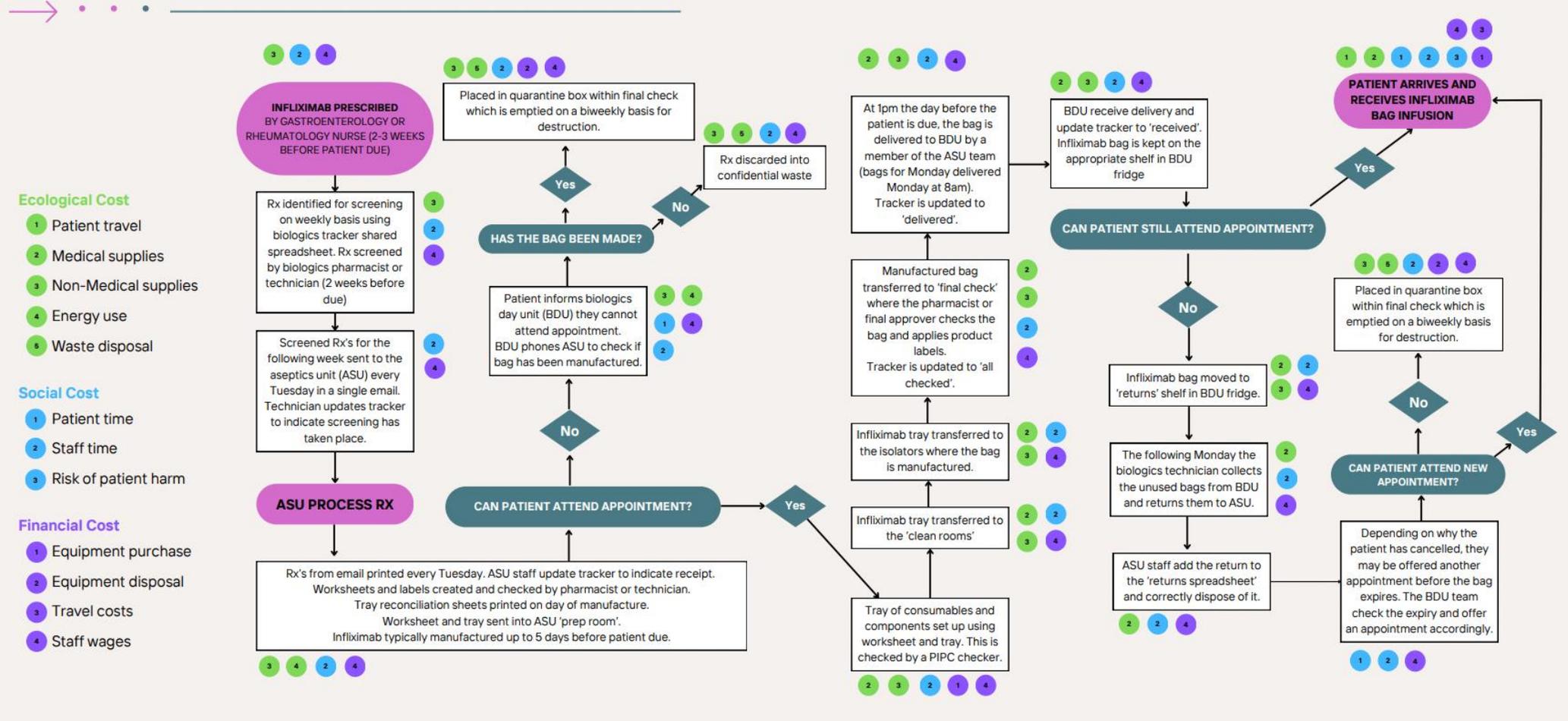
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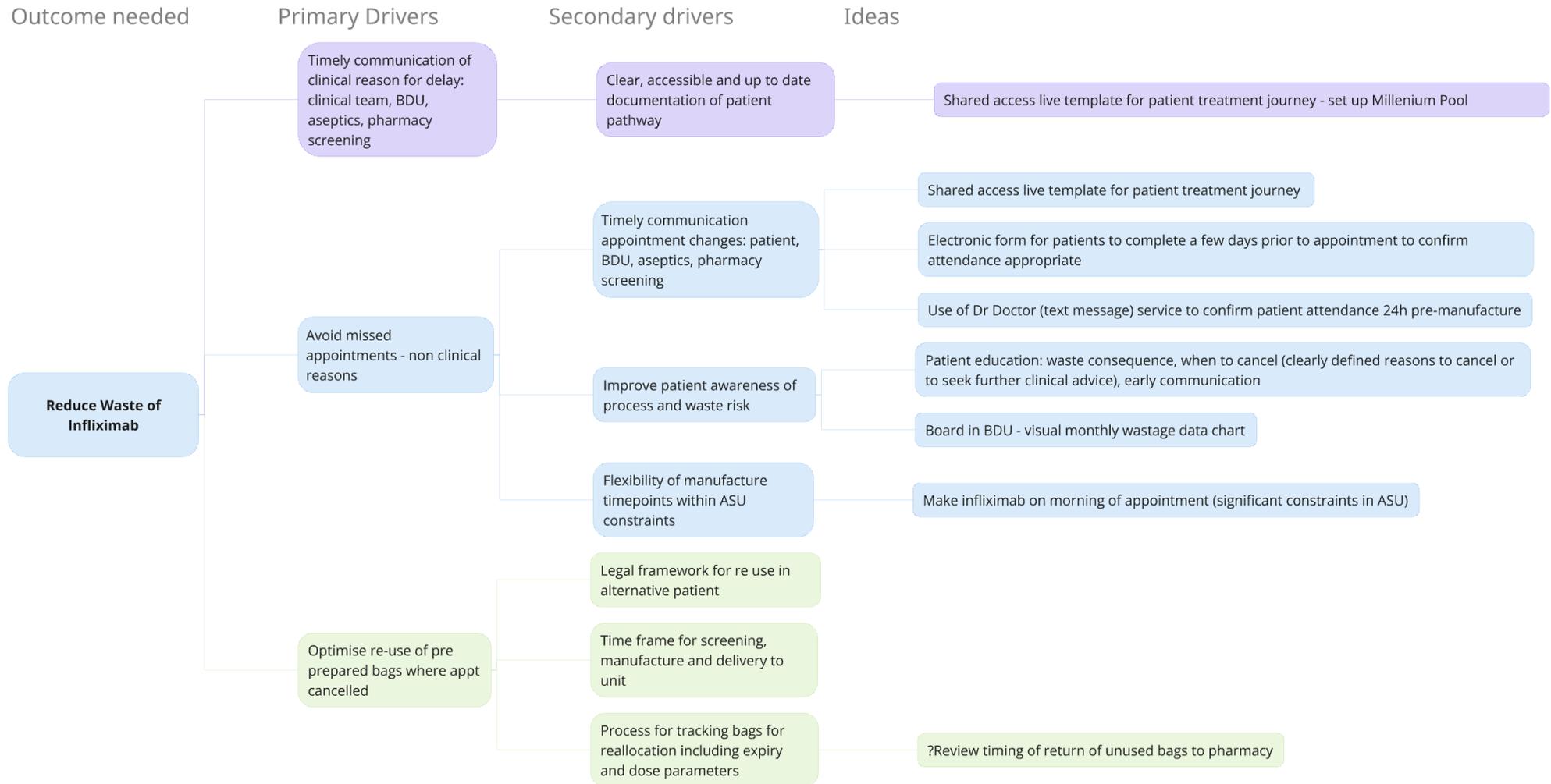


**Appendix 1: Process Map**

Process Map: **INFLIXIMAB – PRESCRIBING TO PATIENT**

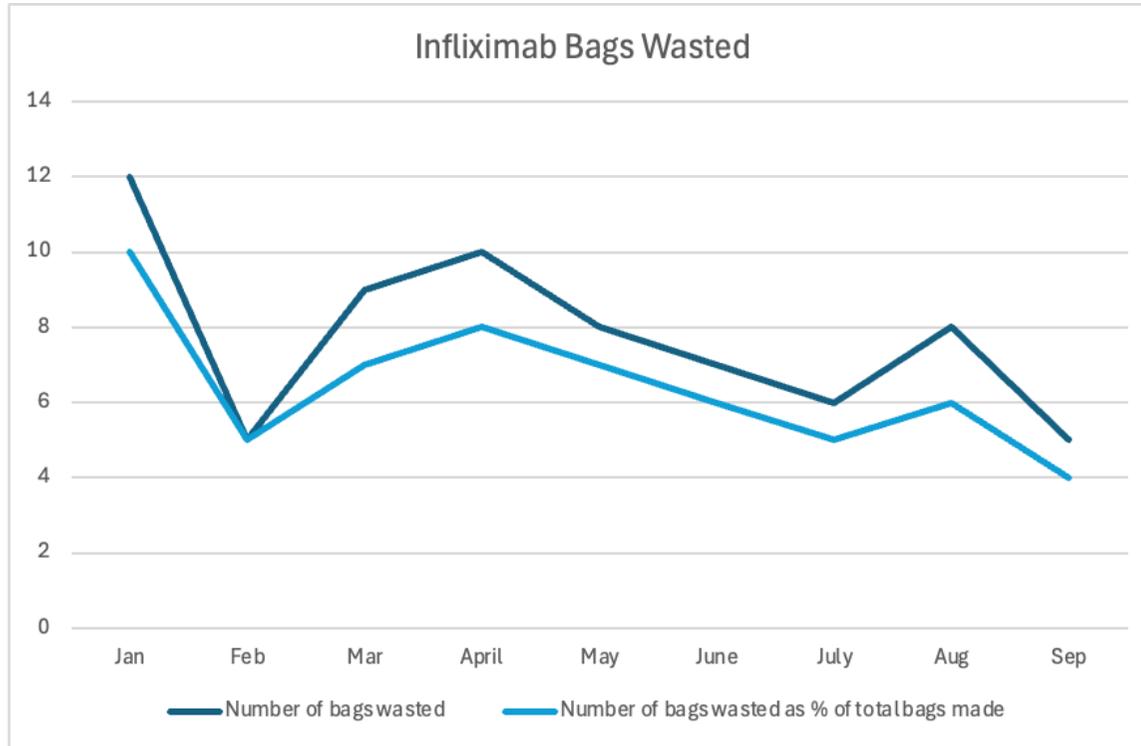


## Appendix 2: Driver Diagram



## Appendix 3: Data Gathering and Results

### Initial Data on Quantities of Infliximab Bag Waste



### **Patient Survey Outline**

'Hello, my name is X and I'm calling from the Pharmacy department at the RUH. Aligned with our sustainability goals at the RUH we are interested in avoiding potential wastage of products we manufacture on site.

Infliximab infusions, which you receive as part of your treatment, is one of these products. There are several good reasons why it may not be suitable for a patient to receive their infliximab at late notice, however, we are looking to understand if we can adapt our services in any way to ensure we are not wasting any product unnecessarily. Our records show you had an occasion where could not attend for/ or receive an infusion in the last few months.

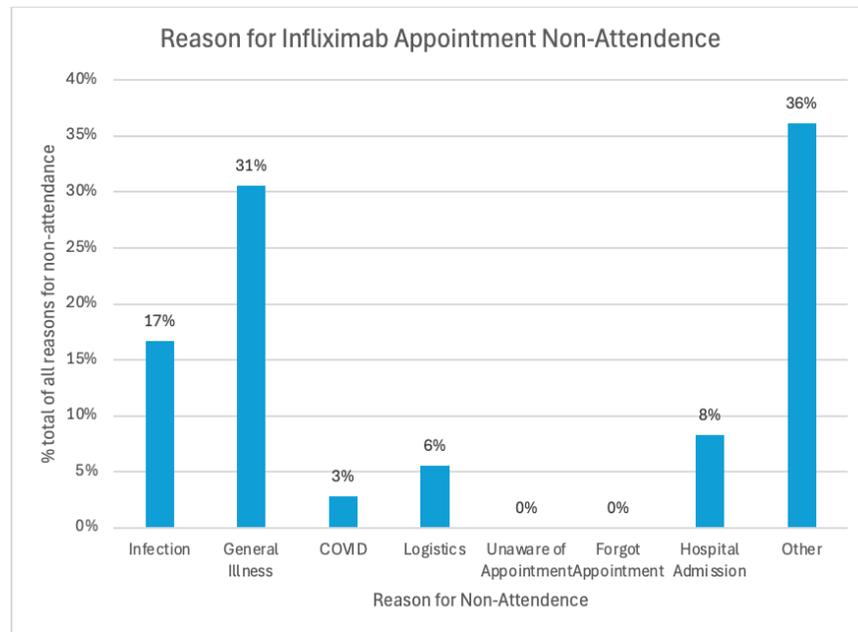
Would you be happy to answer 3 quick questions to help us understand why that was?

Q1) Which reason(s) would/could you not attend an infliximab infusion for?

Q2) Are you aware that if you are unable to attend the bag can't be used and is discarded?

Q3) Would you be able to engage with a text message service asking you to confirm your appointment?'

### **Summary of data gathered from patient questionnaire and electronic records**



# A3: Reducing Infiximab Waste

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## 1. Problem Statement

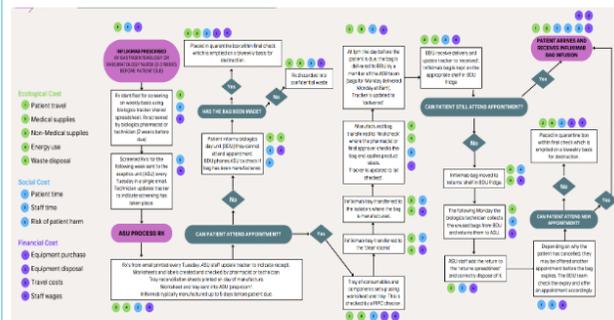
In financial year 2023/2024, the Trust disposed of 76 infiximab infusion bags totalling 373 vials of biologic wasted. This is equivalent to 11% of the bags manufactured in a year. When infiximab bags are disposed of without being administered to a patient, there is both material and resource waste, and therapeutic loss.

Medicines waste costs the NHS £300 million each year and contributes to 25% of the NHS' carbon footprint. The RUH has a goal to drive down carbon emissions to net zero by 2030.

The average infiximab bag costs £292.73 to produce and uses the equivalent of 484 miles of carbon emissions.

## 2. Current Situation

Infiximab is prescribed by speciality clinicians, screened by the pharmacy team, manufactured in ASU and administered in BDU. The process below was mapped with stakeholders from all teams involved in the process.



Data was combined from a patient telephone questionnaire and electronic prescribing records to understand reasons for non-attendance and contributors to infiximab waste. **Waste was deemed avoidable in 45% of cases.** Avoidable was defined as when the reason for cancellation was known before the bag was manufactured. The **reason for cancellation was not documented in 56% of cases** on the current electronic systems that are used by staff involved in the process. It was also found that **59% of patients were unaware that the unused infiximab bag would be discarded if they could not attend.**

## 3. Vision/Aim

**Vision:** That no infiximab bags would be discarded unused.

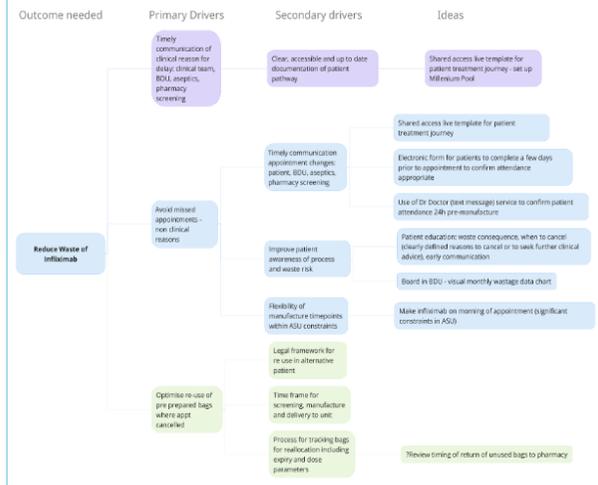
**Aim:** To reduce the number of wasted infiximab infusion bags by 30% by June 2025.

### Objectives:

- To reduce the environmental impact associated with infiximab
- To reduce the financial cost of associated with infiximab waste
- To improve the documentation of rationale for changes in infiximab treatment
- To better integrate the pharmacy clinical team with ASU and BDU to build rapport
- To increase the availability of medicines administration slots at BDU
- To increase patient awareness of the biologics process

## 4. Analysis (Issues and Root Causes)

Use of a fishbone was inappropriate due to the process complexity and tendency to overlook system interdependencies. A driver diagram was created to visualise issues and identify, and categorise, root causes.



## 5. Current Counter Measures and Future State

Concern	Cause	Countermeasure	Owner	Due Date	Status
Patient appointment non-attendance	Forgetfulness (cognitive lapse), transportation issues, communication issues, health issues (e.g. infection, hospital admission)	Text message reminder service	RH	04/25	Not yet started
Lack of patient education and responsibility	Lack of education and understanding around infiximab	Electronic question form sent to patients in days prior to appointment. Educational material for clinics and BDU notice board.	RH	03/25	Not yet started
Poor clinician communication	Multi-team process, multiple communication methods, lack of communication	Use of an existing electronic system (Millenium Pool) to centralise information shared	SO'N	02/25	Planning

## 6. Risks

Risks are dependent on intervention made. The highest risk intervention is reusing manufactured bags (requires a formal change control process with associated risk assessments and require Governance team approval).

## 7. Anticipated Outcomes

- Patient Outcomes:** Clinical benefit of facilitating more timely rescheduling and stock provision, enhanced engagement and shared decision-making – promoting disease control
- Population Outcomes:** Redistribution of funds to other areas of biologics e.g. clinics, staffing helpline
- Environmental Sustainability:** Public Health benefits from disease provision, reduction in associated carbon emissions from less waste production and discard processes
- Economic Sustainability:** Low implementation costs (primarily for administrative tasks) for long-term financial benefit

## 8. Next Steps

A crucial element of the next steps of the project will be to begin the 'do' stage of our first PDSA cycle on improving clinician communication. This is the most feasible intervention as it is data-driven and based on timeframes, cost and forecast impact.





**Critical success factors**

Please select one or two of the below factors that you believe were most essential to ensure the success of your project changes.



People	Process	Resources	Context
<p><input type="checkbox"/> Patient involvement and/or appropriate information for patients - to raise awareness and understanding of intervention</p> <p><input type="checkbox"/> Staff engagement</p> <p><input type="checkbox"/> MDT / Cross-department communication</p> <p><input type="checkbox"/> Skills and capability of staff</p> <p><input type="checkbox"/> Team/service agreement that there is a problem and changes are suitable to trial (Knowledge and understanding of the issue)</p> <p><input type="checkbox"/> Support from senior organisational or system leaders</p>	<p><input type="checkbox"/> clear guidance / evidence / policy to support the intervention.</p> <p><input type="checkbox"/> Incentivisation of the strategy – e.g., QOF in general practice</p> <p><input type="checkbox"/> systematic and coordinated approach</p> <p><input type="checkbox"/> clear, measurable targets</p> <p><input type="checkbox"/> long-term strategy for sustaining and embedding change developed in planning phase</p> <p><input type="checkbox"/> integrating the intervention into the natural workflow, team functions, technology systems, and incentive structures of the team/service/organisation</p>	<p><input type="checkbox"/> Dedicated time</p> <p><input type="checkbox"/> QI training / information resources and organisation process / support</p> <p><input type="checkbox"/> Infrastructure capable of providing teams with information, data and equipment needed</p> <p><input type="checkbox"/> Research / evidence of change successfully implemented elsewhere</p> <p><input type="checkbox"/> Financial investment</p>	<p><input type="checkbox"/> aims aligned with wider service, organisational or system goals.</p> <p><input type="checkbox"/> Links to patient benefits / clinical outcomes</p> <p><input type="checkbox"/> Links to staff benefits</p> <p><input type="checkbox"/> 'Permission' given through the organisational context, capacity and positive change culture.</p>

This template is adapted from [SQIRE 2.0](#) reporting guidelines.

Template References

- [SQIRE | SQIRE 2.0 Guidelines \(squire-statement.org\)](#)
- [Home | Sustainable Quality Improvement \(susqi.org\)](#)