SUSQI PROJECT REPORT

Project Title: Sustainable disinfection: DiffX Reusable bottle Rollout"

Start date of Project: 01/10/2025
Date of Report:11/12/2025

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Background:

Healthcare-associated infections (HCAIs) remain a major threat to patient safety, particularly in acute hospital settings such as operating theatres, where there are high patient turnover and frequent environmental contamination (UK Health Security Agency, 2023). Effective environmental decontamination is a fundamental component of infection prevention and control (IPC), playing a crucial role in reducing the transmission of pathogens, including Clostridioides difficile (C. difficile), a leading cause of antibiotic-associated diarrhoea within healthcare environments (NICE, 2021).

Chlorine-based disinfectants have traditionally been used as first-line agents for environmental cleaning due to their sporicidal activity. However, growing evidence indicates that their effectiveness may be compromised in the presence of organic matter. Additionally, concerns have been raised regarding their corrosive effects on clinical equipment, adverse health impacts on staff, and wider environmental harm (World Health Organization, 2019; University of Plymouth, 2023). Occupational exposure to chlorine products has been associated with respiratory irritation and skin sensitivity among healthcare workers, highlighting the need for safer alternatives (World Health Organization, 2019).

In line with infection control priorities, the NHS has committed to reducing its environmental impact through sustainable healthcare practices, as outlined in Delivering a Net Zero NHS (NHS England, 2020). Single-use disposable products, including disinfectant wipes, contribute significantly to plastic waste and

carbon emissions throughout their lifecycle, from manufacture to disposal (Munns et al., 2022). As such, there is increasing emphasis on identifying solutions that balance effective infection prevention with environmental sustainability.

DiffX is a broad-spectrum disinfectant demonstrated to be effective against bacteria, viruses, and spores, including C. difficile, while remaining active in the presence of organic matter (DiffX, 2024). It is pH-neutral, non-corrosive, and biodegradable, thereby reducing risks to staff, patients, and clinical equipment compared with traditional chlorine-based agents. When used in reusable bottles, DiffX also supports waste-reduction initiatives aligned with NHS sustainability goals (DiffX, 2024).

Within the Trust, DiffX had been successfully implemented across inpatient areas for approximately two years prior to this project. However, operating theatres continued to rely primarily on clinell universal wipes for between-case cleaning, alongside a separate bactericidal agent for floor decontamination. While Clinell wipes are chlorine-free, they are not sporicidal, are single-use, and are non-biodegradable, limiting their environmental sustainability (Gama Healthcare, 2023).

Operating theatres undergo frequent cleaning cycles, with an estimated 20–30 surgical cases per day. Each clean is estimated to use nine clinell wipes and one chlor-clean tablet, resulting in substantial use of disposable wipes. This high volume of waste identified theatres as a priority area for improvement. In response, the IPC team initiated a project to roll out DiffX in reusable bottles across theatre and peri-operative areas. The rollout included main theatres, main theatre recovery, Main Theatre Admission Unit, Manfield theatres, Manfield recovery, and Manfield Day Surgery Unit. The project was delivered in collaboration with theatre managers, recovery leads, the sustainability team, and green team champions.

Specific Aims:

- To reduce the use of non-biodegradable, single-use disinfectant wipes in operating theatres by replacing them with disinfectant solution in reusable bottles.
- To assess the feasibility and staff satisfaction associated with transitioning from disposable wipes to a reusable disinfectant solution within theatre and peri-operative environments.

Methods:

Plan-Do-Study-Act (PDSA) Cycles

DiffX cleaning solution was introduced as a replacement for Clinell wipes across selected clinical areas. Initial rollout occurred in Manfield areas on 28/10/2025 and main theatres on 31/10/2025. This project

evaluates early implementation, staff experience, safety concerns, and compliance using sequential PDSA cycles.

DiffX bottles and sachets were supplied free of charge by the manufacturer during the trial phase. Ongoing supply arrangements require sachets to be ordered via materials management through E-PROC, while bottles will continue to be supplied complimentarily via IPC.

PDSA Cycle 1 – Initial verbal feedback review

Date: 05/11/2025

Plan

Early verbal feedback was obtained from clinical staff following the introduction of DiffX in Manfield (day surgery unit, recovery, theatres) and main theatres (recovery, main theatre admission unit). The review aimed to assess user experience, smell tolerance, allergy concerns, labelling and preparation compliance, usability, and the effectiveness of the training cascade.

Do

On 05/11/2025, the IPC team visited all areas identified above. Feedback was gathered from Registered Nurses (RNs), healthcare assistants (HCAs), coordinators, and green team champions. Preparation, labelling, and real-time use of DiffX were observed by IPC.

Study and act.

Table 1. Initial feedback and observations from all six project areas

Area / Unit	Verbal Feedback	Observations	Actions
Manfield Day Surgery Unit (MDSU)	• RN satisfied with product. • RN reported migraines triggered by smell. • HCA found product easy to carry and use.	• One Datix related to smell sensitivity.	•Ongoing monitoring of smell sensitivities
Manfield Recovery	• Smell reported as strong. •No allergic reactions	• One bottle used per 24 hours. • Labelling compliant.	
Manfield Theatres	• Staff asked for clarification on exit cleaning.	• DiffX prepared but no preparation date on label.	•Reinforced correct dating and labelling. •Reassurance regarding exit cleaning procedures.

		• Product confirmed in use.	•Green champions identified
Main Theatres	• Staff unclear on preparation responsibilities.	• DiffX not yet implemented. • Preparation area ventilated with sink but no secure sachet storage. • Sluice area unsuitable. • Plan to begin use 10/11/2025.	Preparation & secure storage escalated. Supported start date 10/11/2025.
Main Theatre Recovery	• One RN unsure about sachet quantities.	• Product in use. • Labelling correct.	Quantities confirmed.
Main Theatre Admission Unit (MTAU)	• Staff unaware of product.	• DiffX not in use. • Training cascade failure. • RN to inform colleagues; IPC awaiting staff list.	Offered targeted IPC led training.

Positive verbal feedback was reported by RN's and HCA's from MDSU regarding product satisfaction and ease of use. DiffX was observed to be in use in four of the six areas and correctly used in three of these areas. Training and awareness gaps were noted in MTAU and main theatres, who had not yet implemented DiffX. This was addressed by targeted IPC led training. Clarification was provided regarding bottle labelling, dilution strength and exit cleaning. Identification of a secure storage area for DiffX and who was responsible for making the preparation was required in main theatres was escalated to management. Labelling was predominantly correct, except for in Manfield theatres. An isolated sensory intolerance (migraine trigger) occurred in MDSU, will have ongoing monitoring.

PDSA Cycle 2 – Follow-Up Review

Date: 10/11/2025

Plan

To review early compliance, preparation accuracy, labelling, staff tolerance (including allergy concerns), and training effectiveness across Manfield (theatres, recovery) and main theatre areas (recovery and MTAU).

Do

IPC conducted a structured follow-up review including observation of practice, staff discussion, and real-time demonstration of preparation and use.

Study and act.

Table 2. Follow-Up Review from all six project areas

Area / Unit	Direct observation, staff interview	Observations	Actions
Manfield Day Surgery Unit (MDSU)	•Smell reported as strong.	•DiffX in routine use; smell remained the primary concern.	•Continued monitoring of sensory intolerance.
Manfield Theatres	•One RN reported discarding unlabelled solutions and re-preparing	•Fresh preparation observed. •One bottle deformed, likely due to hot •Labelling inconsistencies persisted.	•Reinforced cold/warm water preparation and labelling standards via theatre management.
Manfield Recovery	•Continued reports of dislike of the smell. •One staff member disclosed a confirmed citric acid anaphylaxis, including reaction to odour exposure.	•Ongoing dislike of smell.	•Planned ongoing monitoring.
Main Theatres	•Citric acid allergy concern raised across rotating staff groups. •End-of-shift preparation suggested to reduce workload impact.	•DiffX not yet implemented; managerial approval pending.	•Escalated citric acid allergy concerns for formal IPC risk assessment. •Encouraged managerial approval to proceed.
Main Theatre Recovery	•DiffX use compliant with correct labelling and preparation.	•Reinforced labelling standards via theatre management.	•No action required.

Main Theatre Admission Unit (MTAU)	•One RN stated not familiar and not received any training •RN agreed to cascade learning.	•DiffX present but not prepared due to staff unfamiliarity.	•Delivered immediate education in and demonstration of preparation MTAU.

Compliance improved in Manfield areas; allergy risk required formal escalation; preparation errors (hot water) linked to bottle deformation and odour intensity.

PDSA Cycle 3 – Implementation Reassessment

Date: 25/11/2025

Plan

To reassess product suitability, bottle integrity, and staff tolerance, particularly considering allergy concerns and consistency.

Do

IPC conducted site reviews of routine practice across Manfield and main theatre areas.

Study and act.

Table 3. Implementation Reassessment

•Area / Unit	•Staff Feedback	•Observations	•Actions
Manfield Day Surgery Unit (MDSU)	•Smell disliked but no adverse reactions reported.	•DiffX in use; bottle shape distortion noted.	•Continued monitoring of bottle integrity and tolerance. •Continued monitoring of smell-related issues. •Company informed and stated it could be due to hot water.
Manfield Recovery	•RN preparing and using product correctly.	•Daily use continued; bottle deformation again noted.	•Investigated preparation practices and water temperature. •Investigated potential causes of bottle deformation.
Manfield Theatres	•Some porters continued to use Clinell wipes	•Bottles correctly dated; consistent use observed.	•Reinforced DiffX use among porters.
Main Theatres	•DiffX implementation paused due to a staff	•Not implemented	•Maintained pause in main theatres pending allergy assessment results.

	member with severe citrus allergy. •Managers reported Awaiting skin-prick testing outcomes.		

Summary: Uptake improved where training embedded; allergy risk appropriately triggered precautionary pause in main theatres

PDSA Cycle 4 – Ongoing Monitoring

Date: 02/12/2025

Plan

To focus on bottle stability, PPE use, reported reactions, and compliance across Manfield areas.

Do

Reviews undertaken across all Manfield areas.

Study and act.

Table 4. Ongoing Monitoring

Area / Unit	Verbal Feedback	Observations	Actions
Manfield Day Surgery Unit (MDSU)	• One bottle base deformed, causing instability. • RN with previous migraine triggers reported improved tolerance when wearing PPE. • One episode of a doctor developed a rash following mattress contact cleaned with DiffX.	• Product used daily and dated correctly	•Continued investigation into bottle deformation •Monitored reported rash for recurrence. Supported gradual removal of Clinell wipes.
Manfield Recovery	• Smell reported as strong. No allergic reactions	• One bottle used per 24 hours. • Labelling compliant.	•Continue monitoring smell-related symptoms and escalate if patterns develop.
Manfield Theatres	• Staff asked for clarification on exit cleaning.	• DiffX prepared but no preparation date on label. • Product confirmed in use.	•Reinforced correct dating and labelling. •Reassurance regarding exit cleaning procedures and equipment compatibility. •Green champions identified

Main Theatres	• Staff unclear on preparation responsibilities.	• DiffX not yet implemented. • Preparation area ventilated with sink but no secure sachet storage. • Sluice area unsuitable. • Plan to begin use 10/11/2025.	•Preparation & secure storage escalated. Supported start date 10/11/2025.
Main Theatre Recovery	• One RN unsure about sachet quantities.	• Product in use. • Labelling correct.	Quantities confirmed.
Main Theatre Admission Unit (MTAU)	• Staff unaware of product.	• DiffX not in use. • Training cascade failure. • RN to inform colleagues; IPC awaiting staff list.	Offered targeted IPC led training.

PDSA Cycle 5 – Consolidation Review

Date: 08/12/2025

Plan

Continue monitoring DiffX implementation across Manfield areas, to evaluate preparation accuracy, bottle condition, and progress toward full transition from Clinell wipes.

Do

Follow-up review conducted across Manfield Day Surgery Unit, Manfield recovery, Manfield theatres.

Study and act.

Table 5. Consolidation Review

Area / Unit	Verbal Feedback	Observations	Actions
MDSU	•Ongoing bottle base deformation	•Correct preparation and dating observed.	•Escalated bottle integrity concerns to supplier.
Manfield Recovery	•Staff satisfied and compliant	•Consistent and compliant use.	•No action required.
Manfield Theatres	•Some porters reported still uses clinell wipes	•DiffX prepared but labelling inconsistencies noted. Fully transitioned to DiffX •Clinell wipes still used by some porters, although internal theatres had fully transitioned	•Reinforced dating requirements and continued reduction of Clinell availability. •Reinforced usage of DiffX •Ongoing monitoring planned.

Main Theatres	•Not implemented	•Awaiting skin prick test	•No action required

DiffX bottles and sachets were provided free by the company, however going forward the sachets must be procured from the material management through E-PROC, however bottles would be a complementary or free supply from the company through IPC.

Measurement:

Patient outcomes:

Direct measurement of patient outcome improvement within theatre and recovery settings is limited by both the absence of baseline infections and the short-stay nature of these clinical environments. We will be unable to collect data demonstrating any reduction in infections, but we will monitor for any increase in C. difficile, MRSA, MSSA, CPE, or SSI incident and use literature to support any wider organisational benefits in infection reduction.

Population outcomes:

Direct population-level outcome data was not available for this project. No predicted change on population outcomes was predicted.

Environmental sustainability:

Environmental impact data was obtained from NHS Supply Chain information and manufacturer-provided material specifications. A cradle-to-grave hybrid carbon footprint analysis was undertaken, combining process-based life-cycle assessment with environmentally extended input–output analysis (EIOA).

Process-based analysis was applied to the Ecolab dry cloths, reusable bottles, and water use (warm and cold), while EIOA methods were used for DiffX sachets and Chlor-Clean tablets. Emissions data for Clinell wipes were adopted from published literature (Rizan et al., 2021). The analysis included greenhouse gas (GHG) emissions associated with raw material extraction, manufacturing, transport, disposal, and, for reusable items, ongoing cleaning requirements.

It was assumed that each reusable bottle would be used approximately 1,825 times over a five-year lifespan, with bottles rinsed daily after use. Warm water used for DiffX preparation was assumed to be part of existing processes, with negligible additional environmental impact. All wipes were assumed to be disposed of as clinical waste via incineration, using emission factors published by Rizan *et al,* (2021).

Material quantities were converted into GHG emissions using the UK Government Greenhouse Gas Conversion Factors (2025). Emission savings were translated into equivalent vehicle miles using a factor of 0.3399 kgCO_2e per mile, inclusive of fuel and well-to-tank emissions.

Financial sustainability:

The annual cost of cleaning products used in each area will be calculated pre and post project. This will be based on the using nine clinell wipes, one chlor-clean and one paper bowl per cleaning episode pre project. Compared to four ecolab wipes, Diffx in a reusable spray bottle post project.

Infection-related cost avoidance specific to theatres cannot be quantified, as baseline infection rates for C. difficile, CPE, MRSA, MSSA, and surgical site infections (SSIs) were zero. Average treatment costs for specific infections such as C. difficile or MRSA bacteremia, can be used to demonstrate potential financial saving from the wider organization.

Modelled annual consumable costs per cleaning episode multiplied by 25 episodes/day and adjusted for operational days per year (excluding weekends and bank holidays).

Social sustainability

Staff intolerance and allergy reports was monitored via Datix submissions. Compliance with preparation, labelling and PPE use was monitored via observations. Subjective feedback was gathered during IPC visits regarding ease of use and general satisfaction with the product.

Results

Patient outcomes

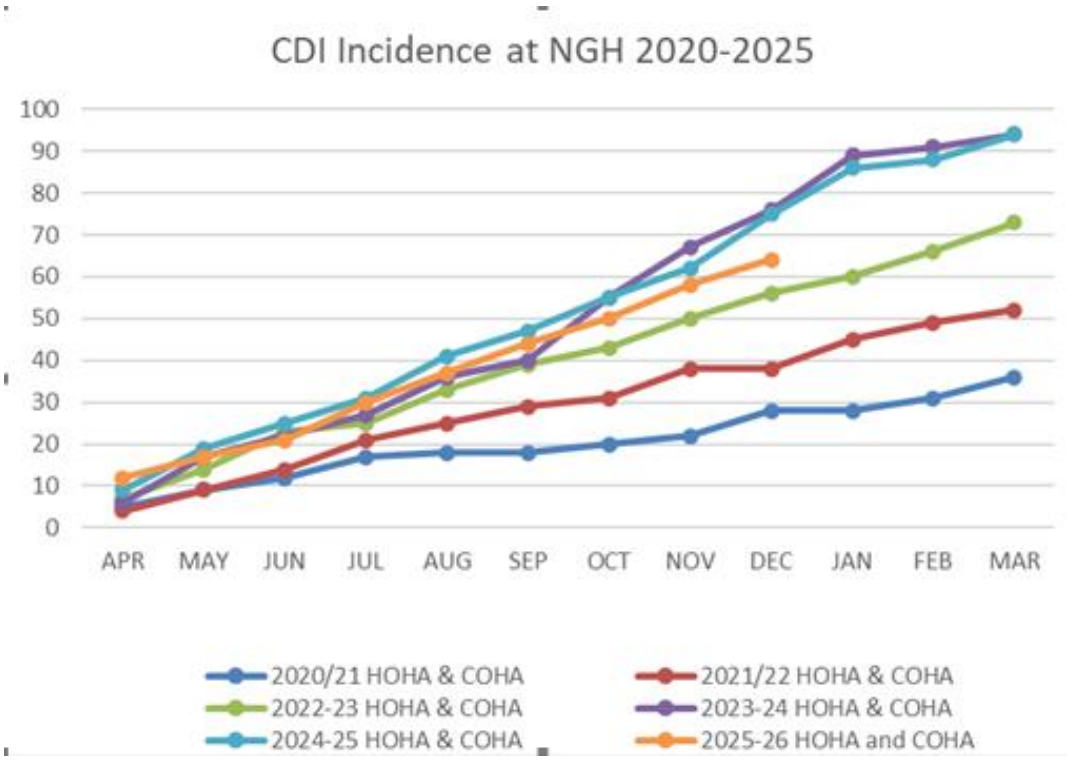
Infection surveillance data demonstrated that, in the 12 months prior to project initiation, there were no recorded cases or outbreaks of Clostridioides difficile (CDI.), carbapenemase-producing Enterobacterales (CPE), MRSA, or MSSA associated with theatre activity. This remained unchanged following the introduction of DiffX, with no post-implementation infection incidents or outbreaks identified.

Theatre and recovery areas typically involve brief patient contact before transfer to inpatient wards or discharge. Consequently, these settings are not optimal for measuring HCAI rates, as many infections manifest after patients leave the peri-operative environment. This limits the ability to directly attribute infection outcomes to environmental cleaning interventions within theatres alone.

Despite these constraints, the continued absence of infection events following implementation provides reassurance that the transition to DiffX did not compromise patient safety and maintained existing high standards of infection prevention.

The trust-wide introduction of DiffX across inpatient wards and theatres is likely to have contributed indirectly to an overall reduction in HCAI's. Published efficacy data indicates that DiffX is active against a wide range of pathogens, including spore-forming organisms such as C. difficile, and remains effective in the presence of organic matter (DiffX, 2024). Introducing a sporicidal disinfectant into theatre environments is therefore consistent with national infection prevention guidance and supports sustained protection for patients throughout the surgical pathway (NICE, 2021). Following that wider rollout, a reduction in HCAI's was observed in ward settings, where patient length of stay enables more meaningful outcome measurement. This supports the effectiveness of DiffX as part of a broader infection prevention strategy. From the data below in figure 1, we could see reductions in C. difficile in 2025-2026 (Orange line,) in comparison to the two previous years.

Figure 1.



Population outcomes:

Although direct population-level outcome data was not available for this project, there was no indication of any adverse outcomes. The trust wide reduction in *C. difficile* may, in turn, contribute to improvements in broader system-level indicators, including reduced length of hospital stay, lower incidence of nosocomial infections, and enhanced efficiency of environmental decontamination processes. Collectively, these factors support improved patient outcomes and strengthen organisational-level population health benefits. Vulnerable population groups, such as the elderly and individuals with significant co-morbidities, may particularly benefit from the observed reduction in infections.

Environmental sustainability:

Carbon modelling demonstrated a 67**% reduction** in emissions per day when swapping from nine clinell wipes, one Chlor-clean tablet and a disposable bowl, to four Ecolab dry wipes and DiffX solution in a reusable spray bottle. This **equates to a significant saving of 20.8 kgCO_2e per day and approximately 6,927 kgCO_2e annually**, based on theatre operational days (see table 1). This is the equivalent to the emissions released from driving 20,380 miles in an average car. The reduction is driven by substitution of a sporicidal solution for multiple consumables and reduced overall material and chemical inputs.

Table 1. Annual carbon emissions pre and post project.

Measure	Value
Baseline carbon footprint (9 X Clinell wipes, 1X Chlor-Clean tablet, 1 disposable bowl)	31.04 kgCO_2e/day
Post-project carbon footprint (4X Ecolab wipes + DiffX)	10.24 kgCO_2e/day
Daily carbon saving	20.8 kgCO_2e/day
Percentage reduction	67%
Annual carbon saving	6926.74 kgCO_2e/year (6.93 tCO_2e)

Although Ecolab wipes were initially selected due to their cellulose composition and marketing as 100% biodegradable, further evaluation demonstrated that their manufacturing process and disposal via incineration are associated with substantial carbon emissions. As all wipes within the healthcare setting are incinerated regardless of material composition, the anticipated environmental benefit was not realised. This was a key learning outcome, emphasising the importance of critically evaluating sustainability claims and considering full lifecycle impacts rather than material composition alone. Despite this, a financial benefit was observed following the switch from Conti wipes to Ecolab wipes.

Economic sustainability:

The annual cost of cleaning products used over the seven theatre areas was calculated pre and post project. This was based on using nine clinell wipes, one chlor-clean tablet and one paper bowl pre project and four Ecolab wipes and Diffx in spray bottle post project. The pre-project daily and yearly cleaning cost for the seven theatre areas was £52.00 and £17,316.90 respectively, (see table 2). The post project daily and yearly cleaning cost for the seven theatre areas was £16.94 and £5,641 respectively, (see table 3). This has resulted in an overall cost reduction of £11,675.88 per year, (see table 4).

Table 2. Theatre cleaning costs pre-project

Item	Quantity per day	Cost per item	Cost per day	Cost per year
Clinell wipe	900	£0.02	£15.25	£5,079.15
Chlor-clean	175	£0.03	£5.25	£1,748.25
Pulp bowl	175	£0.18	£31.50	£10,489.50
Total			**£52.00**	**£17,316.90**

Table 3 Theatre cleaning costs post-project

Item	Quantity per day	Cost per item	Cost per day	Cost per year
Ecolab wipe	700	£0.01	£8.40	£2,797.20
Diffx sachet	14	£0.61	£8.54	£2,843.82
Total			**£16.94**	**£5,641.02**

Table 4. Yearly overall cleaning cost pre & post project

	Pre-project	Post-project	Cost difference
Daily cost	£52.00	£16.94	-£35.06
Yearly cost	£17,316.90	£5,641.02	-£11,675.88

Annual costs were modelled in line with guidance using consumable use per cleaning episode, multiplied by 25 cleaning episodes per day, and extrapolated to annual activity adjusted for theatre operational days (excluding weekends and bank holidays).

Post-implementation modelling indicates reduced annual consumable costs are driven by lower wipe usage and the significantly lower cost of Ecolab wipes, along with the removal of Chlor-Clean tablets and pulp bowls, even before accounting for infection-related cost.

Infection-related cost avoidance specific to theatres cannot be quantified, as baseline infection rates for C. difficile, CPE, MRSA, MSSA, and surgical site infections (SSIs) were zero. Average treatment costs for specific

infections such as C. difficile or MRSA bacteremia, can be used to demonstrate potential financial saving from the wider organisation.

However, Trust-level data indicate that treating a single case of C. difficile or MRSA bacteraemia costs approximately £7,000–£7,500, while bloodstream or urinary CPE infections may cost £15,000–£30,000. While theatre infection risk is lower than inpatient wards, these figures illustrate the potential economic significance of maintaining effective infection prevention practices.

Social sustainability:

This project generated both positive and negative social impacts. A key benefit was the introduction of reusable squirty bottles, replacing pulp-based cleaning products previously stored in sluice rooms. Staff reported that the bottles were practical, easy to use, and readily accessible within clinical areas. This reduced the need to leave workspaces for cleaning supplies, improving workflow efficiency and saving time. The bottles are reusable, with an expected lifespan of approximately five years, and prepared DiffX solution remains effective for up to 24 hours.

Negative feedback primarily related to the strong odour of the prepared DiffX solution. Staff described the smell as unpleasant and sometimes lingering. However, odour intensity was reported to reduce following the introduction of smaller 500 ml bottles, and when correct preparation methods were followed. Incorrect preparation, particularly the use of hot rather than warm water, was associated with stronger odour.

Two Datix reports were submitted in Manfield relating to staff experiencing allergy-type symptoms. Further review identified that affected individuals had known sensitivities to strong smells, such as perfumes. These staff members avoided direct involvement in cleaning with DiffX and reported no adverse effects when using equipment that had been cleaned with the product.

Discussion:

This project demonstrated that a sporicidal disinfectant delivered via reusable bottles can be safely implemented in theatre environments without increasing infection risk. Swapping from a high number clinell wipes, Chlor-clean tablets and pulp bowls to a lower number of Ecolab wipes and Diffx solution in a reusable bottle could save a modelled 6926.74 kgCO_2e and £11,675.88 per year.

PPE reinforcement was required for staff with odour sensitivity to reduce their intolerance risk; however, this introduced a small additional carbon footprint that was not modelled and should be acknowledged as a trade-off.

Environmental benefit did not arise from using “biodegradable” wipes. In healthcare, all wipes are disposed of as clinical waste and incinerated; therefore, biodegradability confers no end-of-life advantage. The carbon difference between Clinell and Ecolab wipes arises primarily from manufacturing processes and reduced chemical inputs. This is an important learning point for future sustainability initiatives.

The intervention altered staff behaviour by reducing the number of wipes used per episode. This behavioural change, alongside product substitution, was central to achieving the observed carbon reduction.

Future opportunities include evaluation of reusable cleaning cloths, subject to infection prevention risk assessment, which may offer further sustainability gains.

The most significant impact was environmental. Carbon modelling demonstrated a 67% reduction in emissions per daily cleaning episode, this equates to an annual saving of 6926.74 $kgCO_2e$ (6.93 tCO_2e), based on standard theatre operational days. Savings were driven by reduced chemical manufacture and reduced wipe usage, not biodegradability, highlighting the value of targeting high-frequency processes such as theatre cleaning. Importantly, the project also generated learning around sustainability assumptions.

Limitations included restricted patient outcome measurement, reliance on modelling assumptions for environmental analysis, predominantly qualitative staff feedback, and limited post-implementation procurement data. Despite these constraints, triangulation of surveillance data, staff experience, and sustainability modelling supports the conclusion that the intervention was safe, feasible, and beneficial. Reinforced PPE use for sensitive staff wasn’t factored in but would increase the footprint of DiffX slightly.

Barriers and Challenges

Key challenges included staff sensitivity to odour, inconsistent training cascades, unclear preparation responsibilities, labelling errors, bottle deformation related to hot water use, and continued reliance on Clinell wipes due to familiarity. These were addressed through repeated education, managerial engagement, identification of Green Team Champions, and supply control measures.

Risks

Identified risks included allergic reactions, inconsistent compliance, and the fact that Ecolab wipes are disposable wipes. Although the likelihood of severe reactions was low, the potential impact warranted precautionary pauses and escalation through IPC governance structures.

Relevance and Next Steps

This project is applicable to other high-throughput environments such as emergency departments, outpatient procedure areas, endoscopy units, and inpatient wards. Next steps include resolving allergy assessments, engaging with the supplier regarding bottle integrity, formalising preparation responsibilities, and exploring Trust-wide standardisation aligned with sustainability objectives.

Conclusions:

- This project demonstrated that sporicidal disinfectant and Ecolab wipes in theatre environments is feasible and beneficial. The intervention maintained high infection prevention standards while delivering significant environmental and potential financial benefits. Key success factors included IPC leadership, iterative PDSA cycles, frontline engagement, and alignment with organisational sustainability goals. The project contributes meaningful learning to the SusQI evidence base and provides a strong foundation for wider adoption.

- Collaboration with theatre managers, Green Team Champions, and the sustainability team was essential in addressing concerns, reinforcing training, and embedding change into daily practice.

- Key learning from challenges included the importance of early identification and management of staff sensitivities and allergies, the need for clear ownership of product preparation, and the risk of assuming that products marketed as “biodegradable” are inherently environmentally superior. The project highlighted that sustainability interventions must be critically evaluated across their full lifecycle.
- To support lasting change, actions have included reinforcing preparation and labelling standards, reducing availability of Clinell wipes ongoing monitoring of staff tolerance, and escalation of unresolved risks through IPC governance structures. The organisation has expressed interest in building on this initiative, dependent on resolution of allergy-related concerns and supplier feedback regarding bottle design. There is potential for wider rollout once these issues are

addressed, alongside continued collection of procurement, environmental, and staff experience data.

- Overall, this project contributes valuable learning to the SusQI evidence base, demonstrating how infection prevention, environmental sustainability, and staff experience can be balanced through structured quality improvement approaches.

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

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Template References

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