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# CWM TAF MORGANNWG UHB/CENTRE FOR SUSTAINABLE HEALTHCARE

## INTENSIVE SUSTAINABLE INNOVATION GROUP SCHOLAR PROGRAMME

### 2022/23 SUMMARY REPORT

CENTRE FOR SUSTAINABLE HEALTHCARE

July 2023  
(updated from May 2023)

## TABLE OF CONTENTS

<b>Executive Summary</b>	2
<b>Introduction</b>	4
<b>Scholar Project Areas</b> (fuller individual scholar reports are also available)	
<b>1. Sustainability of Inhaler use in Primary Care</b>	5
<b>2. Healthy and Sustainable School Travel – Actions for Zero-carbon eco-healthy schools</b>	7
<b>3. Repurposing NHS Cardboard Packaging into Pet Bedding in partnership with a local social enterprise company</b>	11
<b>4. Quantifying food-waste in patient feeding in an acute setting and identifying opportunities for reduction</b>	14
<b>5. Making Connections to improve Climate Resilience for Health</b>	16
<b>6. Office Based Biopsy Clinic</b>	19
<b>Acknowledgements</b>	22
<b>Conclusions &amp; Recommendations</b>	22
<b>Appendices</b>	22
1 – Scholars’ overall evaluation and post programme self-assessment	
2 – Scholars’ evaluation of the two on-line courses	
3 – Local Sponsors’ evaluation	
4 – The Centre for Sustainable Healthcare perspective	

## EXECUTIVE SUMMARY

The Cwm Taf Morgannwg University Health Board (CTM UHB) Centre for Sustainable Healthcare (CSH) Intensive Sustainable Innovation Group Scholar Programme was a bespoke programme. Protected time was seen as a key component of the plan. Due to short-term funding, usual CSH 12 month programme was condensed to 6.5 months. Despite the pressure to start the programme quickly, six scholars were appointed successfully in September 2022. CSH supervisors supported scholars through a range of in-house resources including training courses and materials, web-based networking tools, online case libraries and a sustainability in quality improvement (SusQI) [toolkit](#). Alongside their local sponsors, and with additional support from the CTM UHB Improvement Team, scholars aimed to research and, where possible, deliver a sustainable project over 6 months from September 2022 to March 2023. The scholars came from a variety of settings, including surgery, primary care pharmacy, community paediatrics, medicine, catering and the Regional Innovation and Coordination Hub.

A wide variety of projects were embarked upon. In total, scholars demonstrated work towards each of CSH's four principles of sustainable healthcare: prevention, patient/public empowerment, lean pathways and lower carbon swaps.

Principles of sustainable healthcare	Inhalers	Re-purposing Cardboard	School Active Travel	Hospital Meal Waste	Climate Resilience	Office Based ENT Clinic
Prevention	√		√	√	√	
Patient/public empowerment	√	√	√	√	√	√
Lean pathways		√				√
Lower carbon swaps	√	√	√			√

Scholars were taught the apply, where appropriate, the sustainable value equation and the triple bottom line:

$$\text{Value} = \frac{\text{Outcomes for patients and populations}}{\text{Environmental + social + financial impacts (the 'triple bottom line')}}$$

For example, in the respiratory inhaler project, more than a quarter of patients on the asthma register were found to be prescribed 12 or more SABA inhalers per year and a pharmacist led review clinic was set up to target patients with poor asthma control (*improving patient outcome*). The intervention, focussing on educating patients about more suitable and lower carbon inhaler use, led to a reduction in 16,425 kgCO<sub>2</sub>e compared to the same time period the previous year (*reducing environmental impact*). If this trend can be maintained then the estimated reduction for the year for that practice will be 32,850 kgCO<sub>2</sub>e at the same time as helping to contain costs (*reducing financial impact*). Another project example has built on a change initiated during the COVID-19 pandemic where the scholar calculated the environmental impact of the ENT biopsy delivered under a local anaesthetic in an outpatient clinic instead of under a general anaesthetic in theatre, saving of 154.15kgCO<sub>2</sub>e and £547 per procedure (reducing environmental and financial impacts). Wider benefits of this initiative have resulted in patients benefitting from avoiding potential side effects of general anaesthesia (*improving patient outcome*) and taking less time off work (*reducing social impact*)/needing to travel less to appointments (*reducing population impact- i.e. reducing air pollution*).

The table below illustrates key learning from each project.

<b>Inhalers</b>	<ul style="list-style-type: none"> <li>• More than a quarter of patients on the asthma register in one practice in CTM UHB were found to be prescribed 12 or more SABA inhalers per year.</li> <li>• Estimated carbon footprint reduction of 16,425 kgCO<sub>2</sub>e during project - compared to previous year- equivalent to 47,307 car miles (or 140 return journeys in an average car from Merthyr to London)</li> <li>• Potential “saving” of £2,900 in one practice over 12 months</li> </ul>
<b>Active School Travel</b>	<ul style="list-style-type: none"> <li>• 29% children in CTM UHB are overweight/obese</li> <li>• 44% of primary-school children actively travel to school, when 60% of Welsh primary school children live within a mile of their school (20 minute walk)</li> <li>• Effective strategies for eco-healthy school transport can be complex interventions that require interagency collaboration but have the potential to promote health and sustainability for future generations</li> </ul>
<b>Re-purposing Cardboard</b>	<ul style="list-style-type: none"> <li>• Collection of cardboard at one CTM UHB hospital by Elite, as opposed to the current position of collection of cardboard by Veolia, would reduce the annual carbon footprint by an estimated 502kgCO<sub>2</sub>e</li> <li>• The employment rate of disabled people is 53% compared to 82% of non-disabled people</li> <li>• Elite Paper Solutions is based in Merthyr Tydfil and offers volunteering and employment opportunities for local disadvantaged and disabled individuals</li> </ul>
<b>Hospital Meal Waste</b>	<ul style="list-style-type: none"> <li>• Food and catering accounts for approximately 6% of the NHS’s total carbon emissions – 1,543 ktCO<sub>2</sub>e annually – and the NHS is wasting 18% of purchased food, or one in every six meals</li> <li>• In one CTM hospital, food production and food waste disposal emissions have been estimated at 151.83 tonnes CO<sub>2</sub>e over 7 months and the financial impact of this wasted food is estimated to be in the region of £100,000</li> <li>• This CTM UHB hospital sends its food waste 144 miles to an anaerobic digester in Aylesbury</li> </ul>
<b>Climate Resilience/Adaption</b>	<ul style="list-style-type: none"> <li>• The UK has seen a 53% increase in heat related mortality in people aged 65+ in the last 20 years</li> <li>• Wales has a national climate adaptation plan, Climate Conscious Wales, outlining over 30 actions between 2020-2025 towards achieving a Resilient Wales by 2030</li> <li>• Recommendations to be made to CTM UHB Executive Team/CTM UHB representation at Wales’ National Health Adaptation Steering Group/ signing CTM UHB to Health Care Without Harm’s Scaling Network for Healthcare Climate Resilience</li> </ul>
<b>Office based ENT Clinic</b>	<ul style="list-style-type: none"> <li>• Switching a micro laryngoscopy and biopsy from theatre to office based clinic made an approximate saving of 154.15kgCO<sub>2</sub>e and £547 per procedure</li> <li>• Projections for repeating this switch on 300 occasions over a year would deliver estimated savings of 46,245kgCO<sub>2</sub>e and £164,112.</li> <li>• Patient satisfaction improved due to reduced waiting time, less appointments and travel - formal PROMS and PREMS evaluation applied for</li> <li>• Excellent potential for embedding local anaesthetic lean pathway principle across other specialities.</li> </ul>

The pre and post self-assessment shows the scholars have improved their understanding of, and confidence in applying, sustainable quality improvement and that they felt more motivated to undertake sustainability focused quality improvement projects in the future. Working on these pilot projects, plans and strategies have extended the skills of the scholars in different arenas. Some have even developed their own frameworks and this bodes well for their roles in encouraging others with new insights and ways of working in the future.

100% of scholar respondents had taken up opportunities to connect/discuss with others how to make healthcare more sustainable, and links were made to key individuals and specialty networks within and outside of Wales, including pharmacy, surgery, active travel, catering, waste disposal and adaption.

100% of sponsor respondents felt their scholar had benefitted very well or outstandingly from the programme. All sponsors felt that their scholar had met the programme aims reasonably or very well, 40% of supervisors felt their scholar had met the scholar programme aims outstandingly.

Each scholar reported benefitting from the training and managed well to absorb the learning in the shorter time period. The extent to which they were able to apply all their learning and deliver a full PDSA cycle has been a challenge within the 6 months, but each scholar has plans to develop the work after the programme came to an end. CTM UHB could usefully take steps to maintain this group of scholars as a resource for change. Should the programme be repeated, the recommendation would be to consider developing projects where more than one scholar could work together in known hotspot areas.

Climate change is the single biggest health threat facing humanity<sup>1</sup>. In addition to climate change, the integrity of our environment, on which we depend, is threatened by pollution (air, plastic and chemical pollution), water scarcity, soil degradation, deforestation, and loss of biodiversity.

Whilst healthcare systems have a key part to play in maintaining health in the face of the threat of climate change, the delivery of healthcare is also undermining the health of our populations, by contributing to the problem. If healthcare were a country, it would be the 5<sup>th</sup> largest carbon emitter in the world<sup>2</sup>.

However, climate change can also be viewed as ‘the greatest global health opportunity’<sup>3</sup>. In the NHS Wales Decarbonisation Strategic Delivery Plan 2021<sup>4</sup>, strategies to achieve the Welsh Government’s targets are laid out. While national and international government action is required, for example to decarbonise electricity, transport and supply chains, net zero will not be possible without front line NHS staff.

Clinicians have intimate knowledge of a vast range of medications, resources and equipment used for their daily practice to provide best, evidence-based care for their patients. Non-clinical teams are also essential to ensure that resources and patient care pathways are effective. The combined knowledge and understanding across of all aspects of care is vital when making the carefully nuanced decisions on how to maintain or improve clinical care whilst reducing environmental, social and financial cost.

A CSH Scholar is a health professional or health service manager who can commit discretionary and allocated time to work on a sustainability project over the course of a year. Scholars are supported by CSH through a range of in-house resources including training courses and materials, web-based networking tools, online case libraries, and a sustainability in quality improvement (SusQI) toolkit. Supported by local and CSH sponsors this professional development programme enables scholars to explore a sustainability topic of their choice, and where appropriate develop, run and measure projects that add sustainable value within their service, by considering the ‘triple bottom line’ of reduced environmental harm, reduced financial waste, and adding social value.

Innovatively CTM UHB took the 12 month CSH single specialty group scholar programme and drew together scholars from multi-disciplinary backgrounds within one host organization for an intensive programme over 6.5 months. The aim was to assess the potential for developing a peer support group where clinical staff/managers are empowered, enthused and equipped to further improve their services for the future, and assist organisation-wide change. Funding was available for scholar to have one protected day per week to study/work on their project and extra support was available from the UHB Improvement Team.

The CTM UHB/CSH Intensive Sustainable Innovation Group Scholar Programme aims were to:

1. create a community of practice and increase knowledge about sustainability challenges and solutions in healthcare
2. gain strategic influence, spread good practice and grow the next generation of leaders in sustainable healthcare
3. to deliver a sustainable improvement project within their area of work

### References

1. World Health Organisation 2021 [Climate change and health \(who.int\)](#)
2. The Lancet and University College London Institute for Global Health Commission (2009). Managing the health effects of climate change, *The Lancet Commissions*, 373(6976), 1693-1733, DOI: [https://doi.org/10.1016/S0140-6736\(09\)60935-1](https://doi.org/10.1016/S0140-6736(09)60935-1)
3. Health Care Without Harm and ARUP (2019). *Health Care's Climate Footprint: How the health sector contributes to the global climate crisis and opportunities for action*. Available from: <https://noharm-uscanada.org/content/global/health-care-climate-footprint-report>
4. Welsh Government NHS Wales Decarbonisation Strategic Delivery Plan 2021. Available from: [NHS Wales decarbonisation strategic delivery plan | GOV.WALES](#)

## 1. TITLE Sustainability of Inhaler use in Primary Care

**SCHOLAR:** Charlotte Pritchard

### Background:

Short acting beta agonist (SABA) inhalers account for more than half of the inhaler carbon footprint in Wales. Overuse of SABA inhalers is common in the UK and is known to be associated with increased asthma exacerbations and asthma mortality<sup>1</sup>. Reducing the overuse of SABA inhalers through improved patient education and asthma control will improve patient outcomes and reduce carbon footprint.

NHS Wales is committed to increasing the proportion of low GWP inhalers to 80% of all inhalers prescribed by 2025. If low GWP inhalers are not suitable for a patient, then metered dose inhalers can be switched to a brand containing the smallest volume of propellant gas. Salamol inhalers, for example, have less than half the carbon footprint of a Ventolin Evohaler.

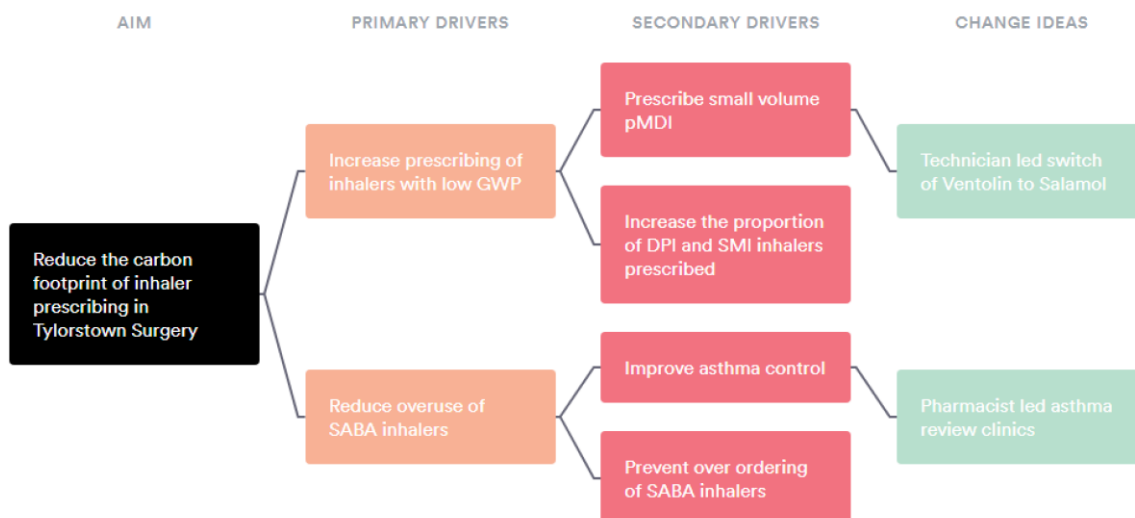
At the end of their useful life, inhalers are often disposed of with domestic waste. When used pMDIs are disposed of in this way, the residual gases are likely to be released into the atmosphere and contribute to global warming. There is no national recycling scheme available for inhalers in Wales currently so the most environmentally friendly alternative is to dispose of used or unwanted inhalers at a community pharmacy. This way the inhalers will be incinerated at a high temperature and the gases will be degraded into chemicals with a much smaller global warming potential<sup>2</sup>.

### Specific Aims:

1. To reduce the number of SABA prescribed
2. To increase the proportion of low GWP inhalers prescribed
3. To reduce the carbon footprint of inhaler waste

### Method / Approach:

This project was piloted in a single practice in a deprived area of CTM UHB. Prescribing data was gathered to identify the inhalers with the greatest carbon footprint in the practice. This showed that Ventolin has by far the greatest contribution to carbon footprint in the practice. For this reason, interventions were focused on prescribing of Ventolin. The following driver diagram was created to identify potential change ideas.



Two change ideas were tested during this project. Firstly, a pharmacist led review clinic was set up to target patients with poor asthma control. Patients were stratified according to the number of SABA inhalers prescribed in the last year as an indicator of potential poor

asthma control, using a digital tool created for this purpose, and patients with concomitant COPD were excluded. More than a quarter of patients on the asthma register were found to be prescribed 12 or more SABA inhalers per year.

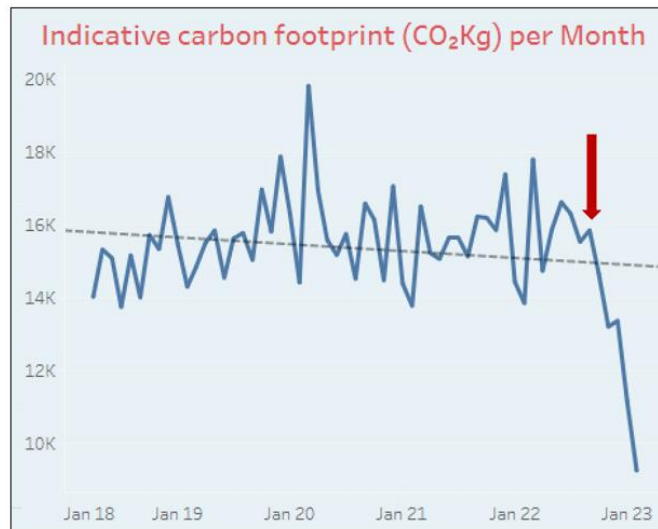
Secondly, switching Ventolin prescribed on repeat to lower carbon Salamol was completed by a Health Board Pharmacy Technician.

In addition to the above, in collaboration with the 'Your Medicines Your Health' campaign, a pilot was set up to promote the return of used inhalers to a selected community pharmacy for incineration. Marketing materials including posters and paper returns bags were provided.

## Results:

### *Environmental benefit:*

The reduction in the monthly inhaler carbon footprint, from 15,831 kgCO<sub>2</sub>e in September to 9,252 kgCO<sub>2</sub>e in February, is illustrated below. The red arrow indicates the start of the project in September.



The total carbon savings for the period September 2022 to February 2023 was 16,425 kgCO<sub>2</sub>e.

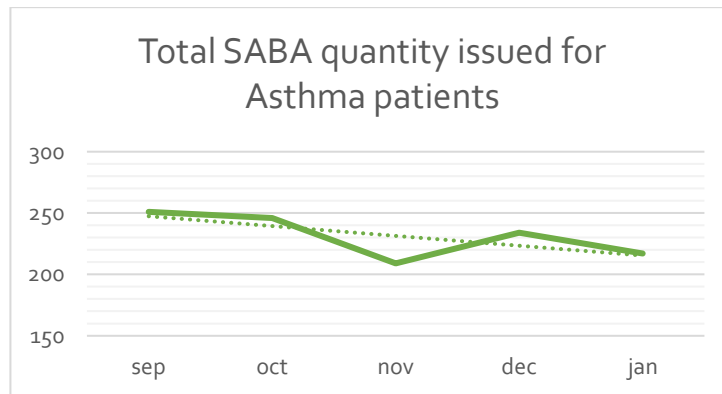
### *Financial benefit:*

Monthly costs for inhalers are increasing, and continued to increase in the pilot practice throughout the project. This is dependent on a number of factors including costs of inhalers for COPD which was not within the remit of this project. However, the project did impact positively on cost.

In the months before the intervention, the average percentage increase in cost was 11.3%, and in the months after the intervention this was reduced to 9.8%. Over a 12 month period this would represent a "saving" of £2,898.43.

### *Clinical and health outcomes:*

Reduction in SABA overuse as indicated by trend to reduction in monthly number of SABA prescribed for patients on the Asthma register at the pilot surgery from September to January.



*Social sustainability:*

A significant proportion of patients were not reviewed in the pharmacist led clinics because they either could not be contacted, could not be booked into the clinic, or did not attend their clinic appointment. Data was not collected to identify if any particular groups were affected, but this is something that could be audited in the future that may inform ways to reduce inequality.

**What steps have been taken to ensure lasting change; how it could be spread to other contexts and suggest next steps to do so.**

The interventions made during the project led to a reduction in 16,425 kgCO<sub>2</sub>e from the previous year, equivalent to 47,307 miles. If this reduction is maintained then the estimated reduction for the year will be 32,850 kgCO<sub>2</sub>e, equivalent to 94,614 miles, a distance greater than the circumference of the earth.

Ventolin inhalers account for a significant proportion of inhalers prescribed in CTM UHB. Switching these inhalers to the Salamol brand reduces the carbon footprint by half. This intervention has the greatest potential to achieve significant carbon savings in a short period of time. This is essential as the climate crisis has direct impacts on human health that is already evident and disproportionately affect patients with respiratory disease. This switch has already been extended to other practices in CTM UHB with the ambition to complete across the Health Board.

Pharmacist led clinics targeting the most poorly controlled asthma patients with the highest SABA use were effective in improving asthma control and in reducing the number of SABA inhalers prescribed. However, the drivers for SABA overuse are complex and other aspects of the patient journey will also need to be addressed in order to achieve lasting change. Tools and support will be rolled out to other practices in the Health Board in order to build on the success of the project so far.

Patient education is effective in increasing the quantity of inhalers that are returned to community pharmacy to be disposed of in the most environmentally friendly way. There is potential that the infrastructure to recycle inhalers becomes available again in the future and it is most likely that this would be delivered via community pharmacy. This will also be extended to all pharmacies in the Health Board.

**2. TITLE Healthy and Sustainable School Travel – Actions for Zero-carbon eco-healthy schools**

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**SCHOLAR: Dr Esther Tobarra Sanchez**

**Background:**

Nearly one in three children in CTM UHB are overweight or obese (29.3%) and this is a high rate within Wales (and noting Wales has one of the highest prevalence of obesity in the UK). It is also important to note that CTM UHB serves an area with a high “Index of Multiple Deprivation” with limited affordability and resources.



Children who actively travel to school can meet between 25-35% of their recommended amount of physical activity per school day, and therefore, the declining figures for Active School Travel feel like a lost opportunity in this context. Also, routines established during childhood will influence adult behaviour and habits.

### Specific Aims:

The ultimate aim of this project is to encourage School Communities (Parents, Children and Young People, Parent Teacher Associations - PTAs, and School staff) and the Cwm Taf Public Services Board (PSB) to introduce policies that increase "Eco-Healthy School Travel" and focus on children as leaders and facilitators of change.

Therefore, the task was to contribute to this delivery plan locally, by encouraging and enabling change, and the objectives of this scholarship project were defined as follows:

1) to collate information to create a behaviourally-informed framework for achieving the co-benefits of "Healthy and Sustainable School Travel".

2) to create a package of multiagency practical guidance that will support Schools, Local Authorities and other stakeholders to bring change through their strategic and investment decisions, better informed influencing and advocacy, enhanced partnerships and project design at a local level.

### Method / Approach:

#### First stage:

1. Literature Review
2. Stakeholder analysis and liaison
3. Field work experience
4. Project definition

#### Second Stage (creation of documents as direct result of previous stage):

1. Tailored writing of a "Local Multiagency Policy document" (in progress)
2. Brief "Step by step Toolkit document" for schools with guidance to overcome obstacles and signposted tools and resources
3. "Charter of Commitments" for Schools and Local Authorities to encourage change
4. Behavioural science-informed "framework" for implementing and assessing the co-benefits of Eco-healthy School Travel initiatives.

#### Third Stage (likely to get all results after the end of this scholarship, post March 2023):

1. Engagement Exercise – Brief questionnaire to Headteachers disseminated through Directors of Education to identify local priorities and current actions, SWOT analysis of perceptions of barriers and needs.
2. Consultation feedback of documents from CORE GROUP. Dissemination of improved and corrected version of documents to stakeholders

### Results:

Current resources produced during the scholarship aimed at the PSB and local Schools include a local framework and a proposed charter.

## Summary of framework

# GREEN CORRIDORS TO SCHOOL

**ACTIONS FOR ZERO CARBON-HEALTHY SCHOOLS**  
Climate solutions are health, education and urban solutions



- The number of children walking to school has decreased in the last decades, predominantly because urban spaces are designed for cars.
- Even when families live within a mile radius, children are regularly driven to school, having lost the perception of "Active School Travel" as the first option
- Childhood obesity rates reach 30%, and sedentarism is also rising, while air quality and safety around schools are decreasing due to traffic.

## STAKEHOLDERS

- Engineers and urban designers
- City Councils and Local Authorities (representatives, transport officers air quality, youth, wellbeing officers)
- Schools, High Schools, PTAs, Education Local Authority
- Healthcare systems, Health Board and Public Health
- Citizens, Neighbourhoods, local businesses
- NGOs, cyclist associations, youth clubs etc
- Involve children and young people! Co-design



## ACTIONS AND ALTERNATIVES

- Creation or identification of greener paths to school
- Supportive policies (priority to active travellers on site) and educational curriculums (pedestrian skills, outreach)
- Involve parents through information communications asking for participation
- Cycling training and bike repair skills
- Organisation of "Walking Buses"
- Respect drivers – suggest "park and stride"
- Promotional activities: awards, identified champion network, clubs, buddy schemes, healthy travel day, safe routes
- Safe lockers, changing rooms, storages
- Low emission school bus, improved public transport

## FEASIBILITY AND RATIONALE

Effective strategies for ecohealthy school transport can be complex interventions that require interagency collaboration, but have the potential to promote the health and sustainability for future generations

By increasing the number of "walkers" to school we will fulfill

### ENVIRONMENTAL, SOCIAL AND HEALTH OBJECTIVES

- Improved urban air quality and traffic congestion
- Enriched communities through social cohesion, identity and a feeling of owning their space
- Promotion of physical activity and weight management habits at the earliest opportunity
- Ensured equity and accessibility as walking is free
- Improved wellbeing, spatial neurodevelopment, attention, behaviour and school attainment
- Quality time and opportunities for encounters between children and their parents or between peers

### BARRIERS and OPPORTUNITIES

- Urban connectivity and distance. Safe and convenient routes for all. Pavements, zebra crossings, traffic lights, lighting, accessible streets for the visually impaired and wheelchair users,
- Green infrastructure – cycle paths, "green corridors" to school (with trees, gardens, bushes and other habitats for flora and fauna including pollinators)
- Family structure, schedules and support
- Community support, charities, local businesses, NGOs
- Education and opportunities for civic organization

## IMPLEMENT AND MONITOR

Consider acceptability: weather and school calendar, analyse which alternatives better serve specific schools or local authorities  
Regular meetings with stakeholders  
Maintain, Transfer and Upscale

## EVALUATION

Decide indicators and multicriteria assessments: walkability index, surveys, number of walkers to schools, CO<sub>2</sub>e saved, air quality...

Created by:  
Esther Tobarra-Sanchez  
Community Paediatrician

## Eco-healthy School Travel Charter of commitments and steps

COMMUNICATION, EDUCATION AND LEADERSHIP
<p><b>Promote Active Travel to School through POLICIES and the NATIONAL CURRICULUM</b></p> <p>Mindful of teacher's busy schedule, Healthy Sustainable Travel can be introduced in school lessons</p>
<p><b>Involve parents, teachers and school staff</b></p> <p>Send communications on Healthy Sustainable travel informing of benefits and asking for participation, acknowledging barriers and being respectful with drivers - suggesting "park and stride" schemes.</p>
<p><b>Provide Pedestrian/scooter/cycling training and give priority to active travellers on site</b></p> <p>Find support from Local Authorities or organisations such as Sustrans</p>

<p><b>Be inventive and organise Active Travel Promotional Activities</b></p> <p>Walking buses, Healthy Travel Day, Awards, Clubs, Walking Buddy Schemes, Safe Routes Activities, etc</p>
<p><b>Identify a Healthy School Travel champion network</b></p> <p>Over time a network will be identified at the school – motivated students, teachers, senior staff or Council Officers could provide strategic leadership.</p>
<p><b>Establish routine promotion messages and monitor progress</b></p> <p>The Healthy School Travel Network group can design new activities and identify local barriers (i.e through surveys)</p>
<p><b>ESTABLISH AND ENABLE SUSTAINABLE TRAVEL</b></p>
<p><b>Consider the provision of improved facilities: lockers, storage, dry room</b></p> <p>Within the school’s capability</p>
<p><b>Safe Routes – Improved facilities for active travel - Green Corridors to school</b></p> <p>Pavements, zebra crossings, traffic lights, lighting, accessibility for visually impaired/wheelchairs, cycle paths, Garden city movements (trees, bushes, habitats for pollinators, urban vegetable allotments in school paths)</p>
<p>Consider options for <b>low emission school bus</b> and improved <b>public transport</b> routes</p>

**What steps have been taken to ensure lasting change; how it could be spread to other contexts and suggest next steps to do so.**

With the policy document and multiagency guide, there will be many chances for local application, potential for generalizability and transferability to other contexts and populations (other Health Boards, Public Service Boards).

The CTM 2030 strategy in CTM UHB sees “creating health” from the start as a key priority. The CTM PSB has taken as a priority the need to develop Active, Sustainable Transport. The CTM healthy weight strategy has likewise identified Active School Travel, children and the built environment as the key foci for action. Between these, all of the public and voluntary sector partners are represented and are all in support of Active School Travel.

There is also potential for local transfer of a “Healthy Travel Charter” developed by Public Health Teams in Cardiff (led by Tom Porter), that could extend commitments to Active School Travel.

It is proposed to build and expand the initiative there is:

1. Implementation of multiagency processes need to support openness and transparency and foster institutional spaces for multi-stakeholder dialogues and adaptive co-management, that includes co-design of interventions, children voices being heard and direct participation of beneficiaries.
2. Some public participation tools and focus group discussions can be suggested to include the knowledge from stakeholders - policy officers, urban planners, academics, school representatives, neighbours and residents and even children and young people themselves-, in a process that leads to mutual learning and knowledge co-creation. Individuals from different backgrounds come together to identify specific problems and then review, evaluate and implement to address them in solution-orientated teams.
3. Assessment of the use of Documents and Resources created through the scholarship. Collection of post-dissemination feedback.
4. Analysing Case Studies in partnership with Sustrans, Healthy Schools, and the Public Health Team.

### 3. TITLE Repurposing NHS Cardboard Packaging into Pet Bedding in partnership with a local social enterprise company

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**SCHOLAR:** Joanne Sullivan

#### Background:

Clean cardboard is currently collected at cost from our hospital sites by a large multinational waste disposal company, Veolia.

#### Specific Aims:

Using the Centre for Sustainable Healthcare sustainable value equation:

$$\text{Value} = \frac{\text{Outcomes for patients and populations}}{\text{Environmental + social + financial impacts (the 'triple bottom line')}}$$

The aim was to identify and potentially reduce the financial and environmental impacts to the Health Board of this practice, alongside identifying and potentially improving the social and population impact of supporting a local social enterprise, Elite Paper Solutions. Elite repurposes clean cardboard into pet bedding.

#### Method / Approach:

I met with the Waste and Fleet cover Manager in CTM UHB. He provided me with the data on cardboard waste in our Estate. Cardboard was separated from other recyclables at each site and collected by Veolia, as stated earlier. I researched local social enterprises in the area that recycle cardboard. Elite Paper Solutions is a social enterprise in Merthyr Tydfil, which means that they are a business with a social or environmental purpose. Elite employs staff who are disadvantaged or disabled. Currently, an Elite van visits RGH twice a week to deliver empty confidential waste bins and exchange them with full bins of confidential waste. The full bins are then taken back to Elite where their contents are shredded.

I contacted the Elite Group Enterprises Manager (Production) and he proposed that that Elite picks up cardboard from RGH at the same time they pick up full bins of confidential waste. He stated that Elite would not charge to remove cardboard but for storage on site, they would require a skip. Cardboard would then be shredded on site at Elite, and then baled. This would be sold to the public as pet bedding, creating revenue and jobs for Elite.

For carbon footprinting method – see Excel spreadsheet in Appendix of full report.

#### Results:

##### *Environmental benefit:*

I compared the current position with the proposed position.

##### *Current position:*

A HGV RORO 7.5 – 17 tonnes travels empty from Veolia, Treforest, 13 km away, to RGH.

Using the UK Government GHG Conversion Factors for company reporting: [GREENHOUSE GAS REPORTING: CONVERSION FACTORS 2022 - GOV.UK \(WWW.GOV.UK\)](#) I calculated the annual emissions rate for the lorry travelling twice a week with an empty 20 yard long skip, and then the emissions rate for the lorry, with a cardboard load in the 20 yard long skip travelling twice a week to Veolia. Adding these together resulted in a carbon footprint of **666.00 kgCO<sub>2</sub>e annually**.

##### *Proposed position:*

Currently Elite uses a Luton van to drop 10 confidential waste bins from Merthyr Tydfil to RGH, 32.8 km away. The Luton Van then transports 10 full bins back to Elite.

It is proposed that cardboard is taken away twice a week by the Luton van at the same time as the full bins. Using [Greenhouse gas reporting: conversion factors 2022 - GOV.UK \(www.gov.uk\)](#) I calculated the annual emissions of a Luton van travelling to RGH twice a week, and the annual emissions of a laden Luton van travelling twice a week to Elite from RGH. This resulted in a carbon footprint of **133.66 kgCO<sub>2</sub>e annually**.

The proposal also includes the one off provision of a 20 yard skip on RGH to collect cardboard. I have calculated the emissions rate for a skip to be taken to RGH by HGV, and for the HGV to return to base – Dainton portable Buildings, Newport, South Wales. Adding these together results in a carbon footprint of **30.32 kgCO<sub>2</sub>e**.

Therefore the total emissions rate for the proposed position is  $133.66 + 30.32 = 163.98\text{kgCO}_2\text{e}$

**In conclusion, the proposed position of collection of cardboard by Elite, as opposed to the current position of collection of cardboard by Veolia, would reduce the annual carbon footprint by  $666.0 - 163.98 = 502.02\text{kgCO}_2\text{e}$**

### *Social sustainability:*

The Welsh Index of Multiple Deprivation (WIMD) is the agreed measure of relative deprivation for small areas in Wales (1.). It identifies areas with the highest concentrations of different types of deprivation including income, health and education. Data is broken down into Lower layer Super Output Areas (LSOAs) comprised of 1,500 people.

Merthyr Tydfil has a higher percentage of LSOAs in Deep-Rooted Deprivation in comparison with Rhondda Cynon Taf. The majority of Elite staff are employed from the Merthyr Tydfil area. It is uncertain where staff employed by Veolia reside. I can estimate that more staff in Veolia are travelling from areas in RCT, Caerphilly or north Cardiff which are areas of less deprivation.

The disability rights organisation, Scope, states that the employment rate of disabled people is 53% compared to 82% of non-disabled people. Disabled people are almost twice as likely to be unemployed as non-disabled people, and 3 times as likely to be economically inactive.

Elite Paper Solutions is based in Merthyr Tydfil and offers volunteering and employment opportunities for local disadvantaged and disabled individuals. Currently, the Elite staff profile consist of 66 disadvantaged/disabled people: 43 staff are paid and 23 are volunteers and pupils from Additional Learning Needs schools/colleges on work experience. Many of the individuals starting as volunteers move on to paid employment at Elite and elsewhere, with the effect of improving life chances and reducing local unemployment.

*“The best thing about Elite is the support – everyone is really nice. I was recommended to join Elite through the Job Centre after I left college. I joined a Kickstarter scheme, then went into a Welsh Government Apprentice Scheme. I’ve taken up lots of training including Level 1 Warehousing. I’ll be looking for employment after the scheme ends”.*

Sue, Troed y Rhiw

*“I’m a supervisor and I love working here. I’ve been here six years now – I started at 7 hours a week and progressed to 37 hours a week. I’ve a forklift truck training, and training to supervisor level. Elite gives me a challenge – you don’t know what you’ll have to sort out each day, but you know you have the support to get it done”.*

Tim, Abervan

*“I have weak bones and have tinnitus. Elite is super – accommodating. I can’t stand for too long, so they put me into an office job. They are happy for me to wear earbuds that helps with the tinnitus. I was anxious taking phone calls, but my confidence has improved massively and I’m now very productive”.*

Samuel, Nelson

*“Elite! We’re good for the animals! We make them bedding!”*

Kyle, Treforest

*“I was the first female to join, eight years ago. I started on an unpaid Job Centre scheme for six months, then got a job as a mentor, and now I am supervising up to 16 people a day. I’ve done presentations, inductions, benefits talks and funding applications as well as lots of other stuff. It’s helped me gain a lot of confidence, and independence inside and outside work. Instead of travelling for 2 and a half hours on the train – I learned to drive, and it takes me 30 minutes if that. The best thing about Elite is watching people progress”.*

Maria, Aberdare

*Names have been changed to protect confidentiality.*

## Financial benefit:

### Current position:

Veolia provide a RORO (roll on roll off) skip, at £15 per month (£180 annually). The skip is exchanged once a week and transported on a HGV lorry to the recycling plant in Treforest. In the month of October the cost of removal of cardboard was £57.11. Assuming the weight of cardboard collected in October is typical of an average monthly weight, the cost of picking cardboard up would be £685.32 annually.

Therefore, the estimated total cost to CTM UHB of removal of cardboard in RGH is £180 + £685.32 = **£865.32 annually**.

### Proposed position

Elite have offered to pick up cardboard at no cost to CTM UHB and they require a skip to do so.

CTM RIC Hub have offered to purchase a skip and donate to CTM UHB, in line with supporting work plan sustainability targets. It is proposed that Elite would collect cardboard from the skip, but not own it. The Manager obtained quotes. To purchase a **20 foot enclosed skip, including delivery and VAT = £2766**. It is proposed that costs would be met through underspend of RIC Hub and owned by CTM UHB.

The current and proposed costs to CTM UHB of cardboard collection in RGH are outlined below.

Status	Company	Cost of skip hire per month /one off (£)	Cost of Skip hire annually (£)	Cost of collection/ month (£)	Cost of collection/annual (average) (£)	Annual/one off cost (£)
Current	Veolia	15/month	180	57.11	685.32	865.32
Proposed	Elite	0	0	0	0	0
Proposed	RIC Hub	£2766/one off	0	0	0	£2766/one off

## What steps have been taken to ensure lasting change; how it could be spread to other contexts and suggest next steps to do so.

The contract to collect cardboard by Veolia is agreed with NHS Procurement Services, and is Wales wide, covering all Health Boards in Wales. This means that Veolia is contracted to collect cardboard from each site in CTM UHB, including RGH. The CTM UHB Waste and Fleet Manager is currently in negotiation with Veolia and Procurement to progress this proposal, with this report considered as support from the CSH Scholar.

There are two possible positive options:

1. An agreement with Veolia commences where, as part of the business social responsibility, includes enabling all cardboard to be collected by Elite.
2. If the contract is required to continue, Elite can sort and collect “clean” cardboard at RGH, and the Veolia contract is adjusted in line with a reduction in “dirty” cardboard removed, and consequent reduction in costs to CTM UHB.

Discussions I held to date with Veolia suggested that Option 1 may be viable, and that option 2 is not. This may change over the life of the pilot.

As stated earlier, it is difficult to ascertain what proportions Veolia would separate “clean” from “dirty” cardboard compared with Elite. If both parties were willing, we would need to work with them to look at their processes and sorting.

Also, the weight of cardboard was estimated from just one month – October 2022. To more accurately determine the weight over 12 months, we would need to look at the average monthly rate over a full year.

Finally, as this project supports the role of NHS Wales as an Anchor Institution, there may be bursaries available from the Green Group or Decarbonisation Group within the Health Board, or through the Third Sector. If the project was to be expanded across the Health Board, the costs would be required to be researched.



## 4. TITLE Quantifying food-waste in patient feeding in an acute setting and identifying opportunities for reduction

**SCHOLAR:** Rhiannon Facey-Richards

### Background:

Food and catering accounts for approximately 6% of the NHS's total carbon emissions – 1,543 ktCOe annually. It is particularly pertinent to note that the NHS is wasting 18% of purchased food, or one in every six meals. Food-waste in the NHS is directly linked to climate change – food as a whole is responsible for a quarter of the United Kingdoms (UK) carbon footprint. Food is also a vital part of a patient's recovery and health: if this food is not being consumed and is subsequently wasted, this can potentially also lead to extended recovery times in hospital.

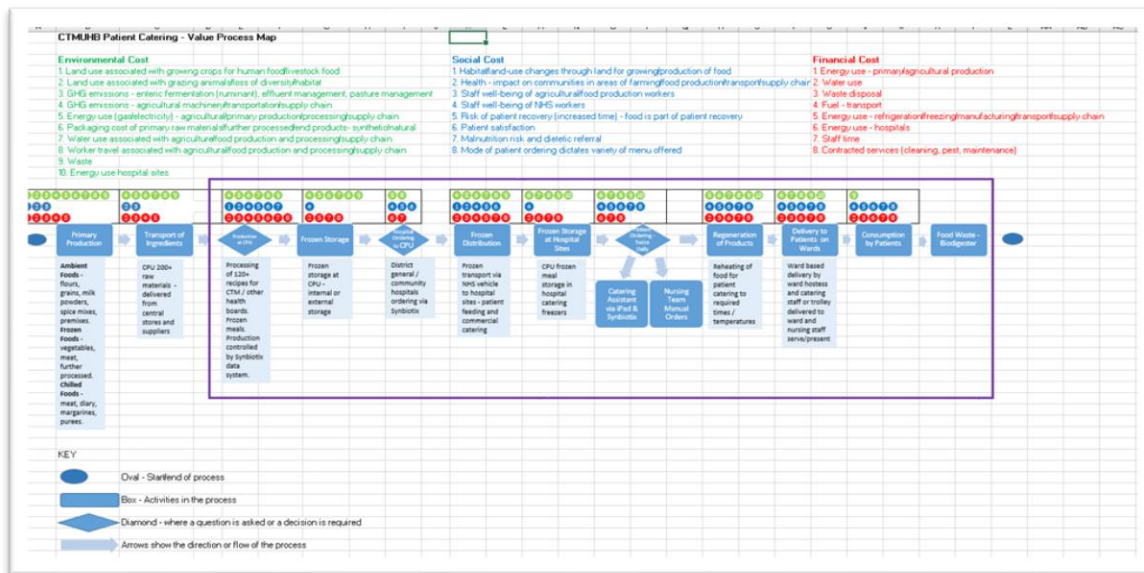
### Specific Aims:

The six-month project aim was to engage with Catering and Nursing colleagues to quantify the food-waste in patient feeding. The pilot was conducted at Princess of Wales Hospital (POWH) where the site has non-ward hostess (n=16) and ward hostess (n=4). The data collection methodology was to establish the number of wasted meals, cost and environmental impact to the Health Board between ward hostess and non-ward hostess. The medium-term goal is to develop a SusQI project to educate staff the need to prevent this waste from occurring – thus reducing all associated costs with producing and manufacturing food that is not consumed by patients, and re-measure.

### Method / Approach:

A patient catering value process map was produced to give an overview of the social, economic and environmental impact of food production (Figure 2 below).

**Figure 2: CTM UHB Patient Catering Value Process Map**

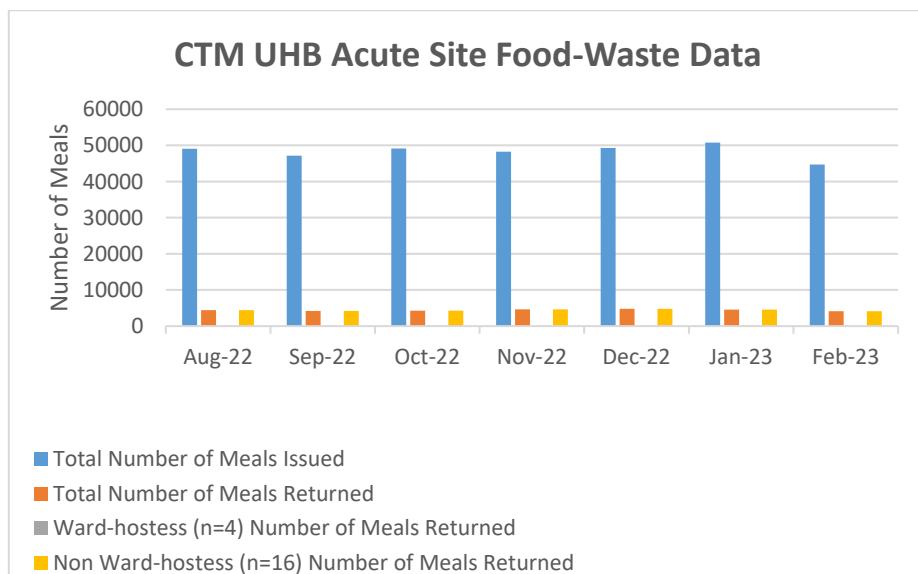


After the value process mapping exercise highlighted the complexity of the project, it was decided to refocus the project on measuring patient food-waste only at one acute site. The next step was the compilation of a methodology for ward audits conducted by Facilities Technical Compliance. *Cook et al (2021)* developed a scientific hospital food-waste audit consensus tool from the most common food-waste audit methods and this assisted in identifying the types of food-waste to focus on.

### Results:

The results of the food-waste quantification study over a seven-month period were measured.

**Graph 1 – Food-waste data for one acute site over a seven month study**



*Environmental benefit:*

GHG emissions associated with food production and food waste disposal emissions have been estimated.

**GHG Emissions – Waste Disposal**

Food waste is transported from Bridgend to Aylesbury (formally Carmarthen) to be disposed of via anaerobic digestion. To estimate the GHG emissions associated with food waste disposal, a process-based carbon footprinting methodology has been used. It was decided not to use the BEIS database emission factor for anaerobic digestion as the factor excluded emissions associated with the anaerobic digestion process itself and only included transport emissions for an average distance to an anaerobic digester. Instead, a new transport emission factor was created using the BEIS database and actual distance data to the anaerobic digester located in Aylesbury.

WTT emissions factor for HGV average laden (from BEIS database, on WTT tab): 0.02599 kgCO<sub>2</sub>e/tonne.km

HGV average laden emissions factor: 0.41 kgCO<sub>2</sub>e/tonne.km

Total HGV emission factor: 0.43599 kgCO<sub>2</sub>e/tonne.km

Carbon emissions of **waste disposal** = 20.48640 tonnes \* 0.43599 kgCO<sub>2</sub>e/tonne/km \* 231.75 km = **2069.95 kgCO<sub>2</sub>e (7 months)**

**GHG Emissions – Food-waste Production**

GHG emission associated with the production of the food wasted has been estimated based on an Environmentally Extended Input Output Analysis (EEIOA) where cost is converted into carbon emissions. An emission factor for food and catering, 1.483 kgCO<sub>2</sub>e/£, was taken from the 20/21 Greener NHS database.<sup>6</sup> The average cost of a patient meal is £3.25.

Carbon emissions of **food production/procurement** = £3.25 \* 1.482631 kgCO<sub>2</sub>e/£ = 4.82 kgCO<sub>2</sub>e \* 31071 = **149762.2 kgCO<sub>2</sub>e (7 months)**

**Total GHG emissions**

**151832.15 kgCO<sub>2</sub>e (7 months)** or 151.83 tonnes CO<sub>2</sub>e (7 months)

In summary, the GHG emissions associated with food production and food waste disposal emissions have been estimated at a total of 151,832.15kgCO<sub>2</sub>e (151.83 tones CO<sub>2</sub>e) in 7 months.

*Financial benefit:*

The financial impact of this wasted food is estimated to be in the region of £100,000 over a 7-month period. This is based on the purchase price of the food at approximately £3.25 a meal and 31071 wasted meals in a 7-month period. It should be noted that the financial impact just not take into account waste packaging or the actual disposal costs charged by the company collecting the waste-food for anaerobic digestion.



### *Clinical and health outcomes:*

#### **Patient outcomes:**

- Ward hostess versus non-ward hostess – the data collected clearly identifies a lower return of meals to the Catering department via the ward hostess service model. This is desirable for the patient as they get a choice of food from a dietetically assessed menu with Catering staff dedicated to taking orders and serving the meal. They are ordering what they want to eat from a patient feeding menu.
- Protected meal-times – the protected meal-time outcome is essential to patient recovery and contributes to the overall care plan.
- Recovery and nutrition as medicine – this is an essential part of patient care plan and links to recommendations by the BAPEN 2012 report.

#### **Population outcomes:**

The population outcomes of food-waste in a non-ward hostess Catering model in an acute site are far reaching, and stretch further than financial, social and environmental. The BAPEN (2012) highlighted the clinical outcomes of patient choice, food intake and malnutrition as intrinsically linked to food-waste. These drivers ultimately lead to longer patient recovery times, increased stays in hospital and a larger population of 'nutritionally at-risk patients'. The CTM UHB has a corporate strategy of improving patient nutrition and this is particularly imperative when 85% of the staff population live in the three regions of Rhondda, Merthyr and Bridgend – hence our staff population are our future patient population.

### *Social sustainability:*

Covid-19 had a big impact on space in hospitals both ward hostess and non-ward hostess, the social activity of eating was removed to bedside and a mind-set change is now required. Bed shortages have meant space formerly used for patient eating/socialising are no longer available or have been turned into cubicles. In some hospital settings protected meal-times are not a priority which again has an impact on food intake and associated food-waste, it can limit nutrition intake.

### **What steps have been taken to ensure lasting change; how it could be spread to other contexts and suggest next steps to do so.**

- Potential collaborations with Cardiff University and WRAP Cymru on further projects/funding/resource.
- The finalisation of a food-waste audit process and training of a methodology for consistency
- A further paper utilising the proposal on our acute site to move to “ward-hostess” based on environmental figures of food-waste, monetary figures and social factors in patient care.
- Developing a uniform waste-audit methodology for CTM sites (acute and community).
- Step 3 SusQI Designing the improvement and Step 4 SusQI Measuring the Impact - training for all Catering staff on food-waste and digital recording.
- A pan-Wales approach!

## **5. TITLE Making Connections to improve Climate Resilience for Health**

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### **SCHOLAR: Dr Tom Downs**

#### **Background:**

Climate change impacts population health, but also healthcare's ability to provide effective health services to their population. Health adaptation is the deliberate action taken to protect population health and well-being in response to the stress posed by climate change. The effectiveness of health adaptation depends upon the climate resilience of healthcare, defined as health services capacity to anticipate, respond to, cope with, recover from, and adapt to climate related shocks and stresses whilst continuing to maintain ongoing improvement in population health and well-being.

CTM UHB has specific vulnerability and opportunity to improve resilience to climate change based on the demographics of the population: including high levels of social deprivation and being a key anchor institution with the majority of our workforce living within the health board area.

### **Specific Aims:**

This project aimed to raise awareness of the need for health adaptation within CTM UHB, with aim of generating key considerations and recommendations for the health board to improve climate resilience for health.

### **Method / Approach:**

The project involved reaching out to those with an interest in health adaptation within the health board. I met with our health board Green Group and public health colleagues, gathering ideas and input from them. This was a useful process for raising awareness, but also shared learning, and allowing those with a particular interest and for whom this was relevant for their role to get more involved, e.g. a local public health registrar. This process also helped to understand what work was already going on within the health board which was relevant to improving climate resilience, such as the health board's Anchor Institution Plan.

The project also involved making connections with informal and more formal networks across Wales and beyond. This was very helpful for gathering case studies and learning from health facilities that have been impacted by climate change, as-well as from organisations and groups that were further along with their thinking and action on adaptation. I was invited to become a member of Wales' National Health Adaptation Steering Group which allowed me to better represent CTM UHB, as-well as sign CTM UHB to Health Care Without Harm's Scaling Network for Healthcare Climate Resilience.

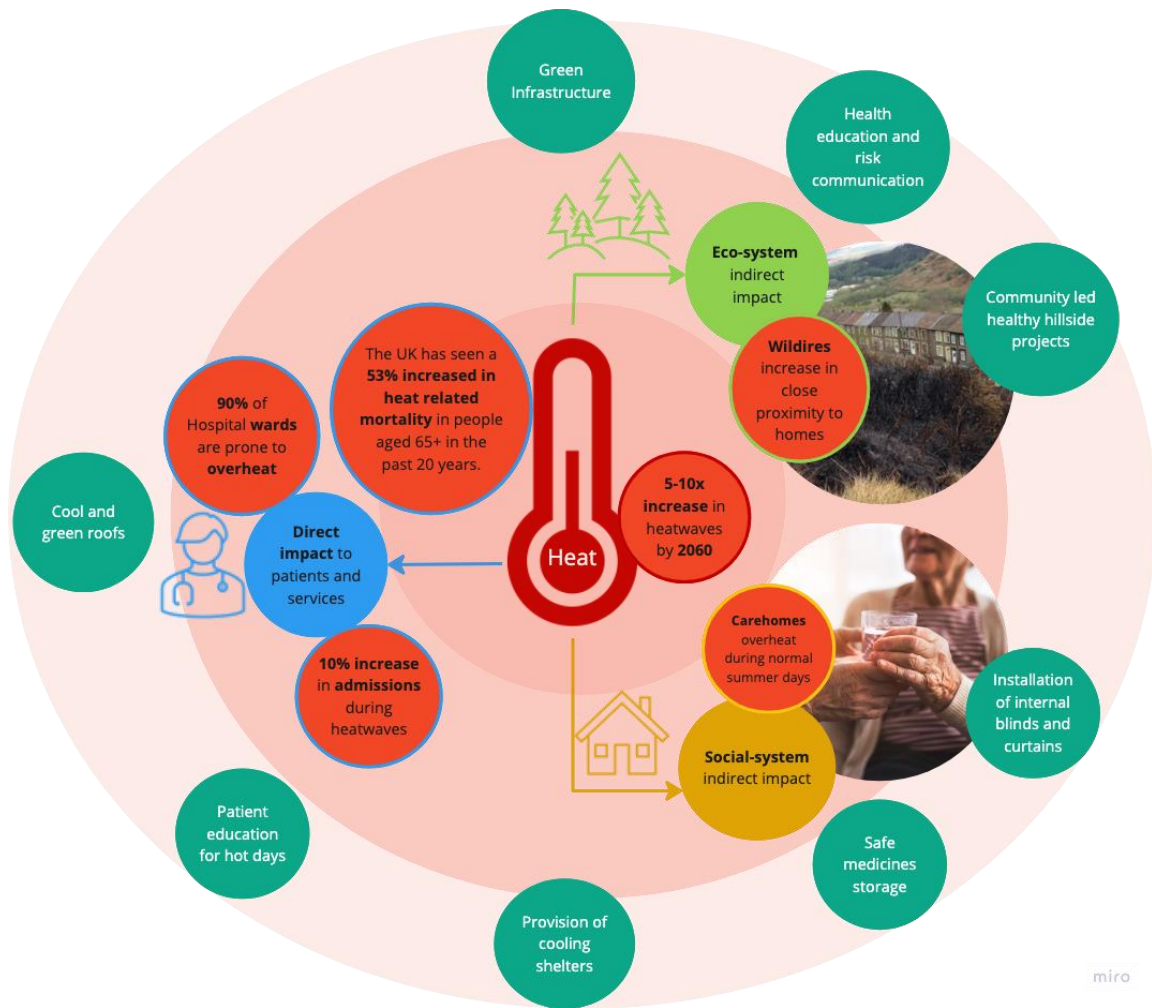
### **Results:**

The key outcome of my sustainability scholarship is a board paper that will be presented to the Executive team. The findings and recommendations from the last six months will be foundational for the health board developing their own health adaptation strategy. This will allow the health board to meet key recommendations from Chief Medical Officer which includes developing their own health adaptation strategy.

Value and action learning were generated from the process of doing the sustainability scholarship over the last six months, from shared learning, raising awareness and building key strategic partnerships. The project has meant bringing people together within our health board that have an interest in the topic, as-well as making sure the health board is better connected with national work on adaptation planning and part of scaling networks of good practice across Europe.

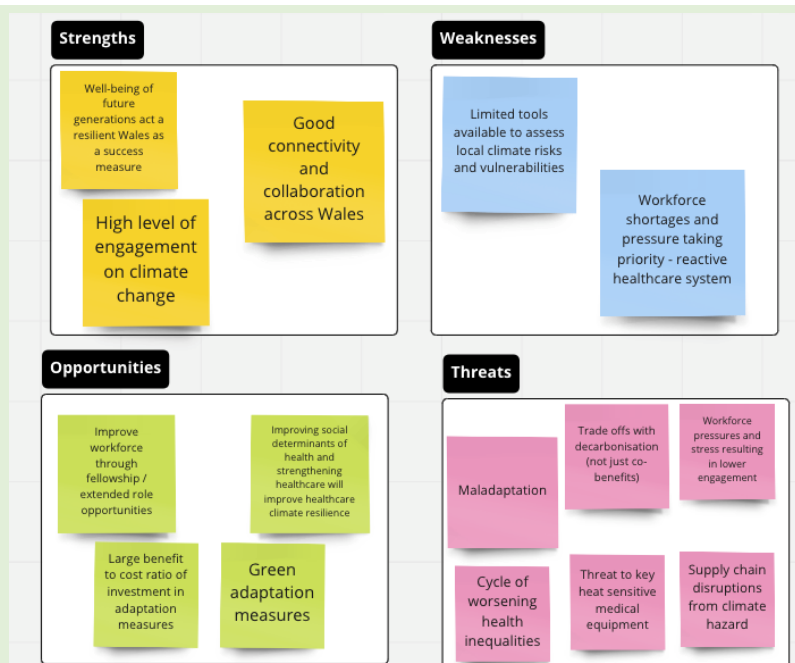
This hopefully has helped to set the ground for future work on adaptation within the health board and improving healthcare climate resilience.

The conversations I have had about my project will have helped to raise awareness and has helped to assess where the health board is in terms of adaptation planning, as-well as begin to understand what our local vulnerabilities are and what our current gaps in knowledge are.



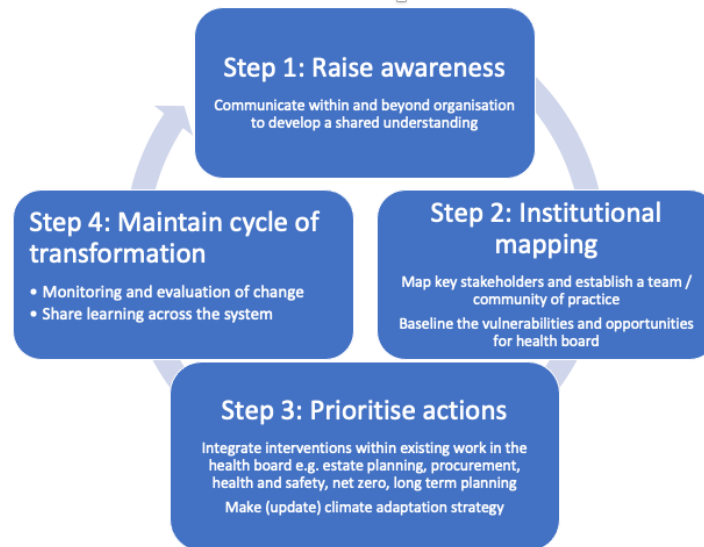
This figure above is taken from the final paper exploring the hazard of heat in CTM UHB: it's impacts to service delivery as-well as to population health indirectly via social and eco-system impacts alongside key adaptation actions to build resilience to heat.

The figure below shows some of the learning happening around the Strengths Weaknesses Opportunities and Threats to adaptation within Wales, that I was able to feedback to National Adaptation Steering Group based on conversations and input had over the last six months.



## What steps have been taken to ensure lasting change; how it could be spread to other contexts and suggest next steps to do so.

The figure below shows our proposed next steps for CTM UHB as part of a continuous cycle of improving healthcare climate resilience, which will be part of the final paper presented to the health board's Executive Team.



## 6. TITLE Office Based Biopsy Clinic

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**SCHOLAR:** Mr S Rao Pasunuru, Specialty Doctor ENT

### Background:

The Covid-19 pandemic has strained the delivery of healthcare on a global scale. Patients suspected to have cancer were amongst the worst affected cohorts due to the limited availability of operation theatre time. In the NHS, operating theatres were not able to function at full capacity due to various constraints. There was a shortage of beds for patients to get procedures done in operating theatres under general anaesthesia (The BMA, 2022). Patients had to wait longer for cancer treatment (Gregory, 2022).

### Specific Aims:

The scope of this project was to perform biopsies of the throat in a clinic setting under local anaesthesia. This would reduce bed occupancy, the need for operating theatre time and moreover, improve convenience for patients. The development of lean pathways would reduce expenses for the Health Board and make it more environmentally friendly. The secondary aim was to calculate and compare the expenses and carbon footprint of performing biopsies under general anaesthetic and local anaesthetic.

### Method / Approach:

A hybrid carbon footprinting methodology was used to estimate the carbon footprint of throat biopsies conducted in clinics as opposed to theatres, combining environmentally extended input-output analysis with a process-based analysis. An inventory list was created which lists anaesthetic medications and gases, surgical and anaesthetic equipment, lab investigations, water and clinical waste. Electricity usage in the theatre has been excluded due to lack of data. However, it is included as part of the in-patient bed day and outpatient appointment. Clinical waste generated by both pathways has been weighed and noted separately. Rather than cost, the

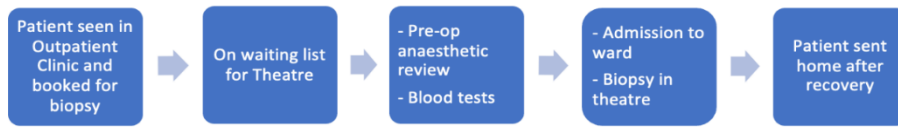
carbon footprint generated by each pathway from travel was compared. The maximum distance covered by the health board from where these procedures are conducted is 40 miles. An assumption has been made that an average of 20 miles is taken for patient travel as patients would come from different corners of catchment area. The carbon footprint is calculated using carbon emission factors of various inventory items by referring to databases like [www.gov.uk](http://www.gov.uk), Greener NHS20/21, and applying them to the activity data collected (SusQI, 2022).

The cost involved for medication and equipment have been obtained from the theatre procurement department. Cost of operation theatre codes have been obtained from the finance department of the Health Board. Although the number and roles of staff involved in the CP are vastly different to the NP, their wages are not calculated due to the complexity involved in obtaining their salary scales. As the novel pathway includes fewer staff, this exclusion means the results presented are an underestimate of its reduced financial cost, compared to the conventional pathway.

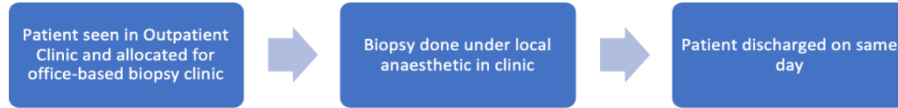
Figure 1: Showing the steps for the Conventional Pathway (CP) and The Novel Pathway (NP)

**Design**

**Conventional Pathway (CP)**



**Novel Pathway (NP)**



*Environmental benefit:*

It was determined that the carbon footprint was 276.05kgCO<sub>2</sub>e for biopsies performed in theatres under anaesthesia as compared to 121.9 kgCO<sub>2</sub>e for biopsies performed in clinic for a procedure called Micro laryngoscopy and biopsy. These data show an approximate saving of 154.15kgCO<sub>2</sub>e. This value is quite a significant reduction of carbon footprint.

The carbon footprint savings are mainly due to reduction in use of equipment and patient travel in the NP (Figure 2). Patient and attendant travel journeys are reduced significantly from 6 journeys in CP to 2 journeys in NP thereby not only reducing carbon footprint but also reducing road traffic and air pollution. Clinical waste generated through the conventional pathway is calculated as 2340g compared to 154g in novel pathway thereby reducing the clinical waste by 93%

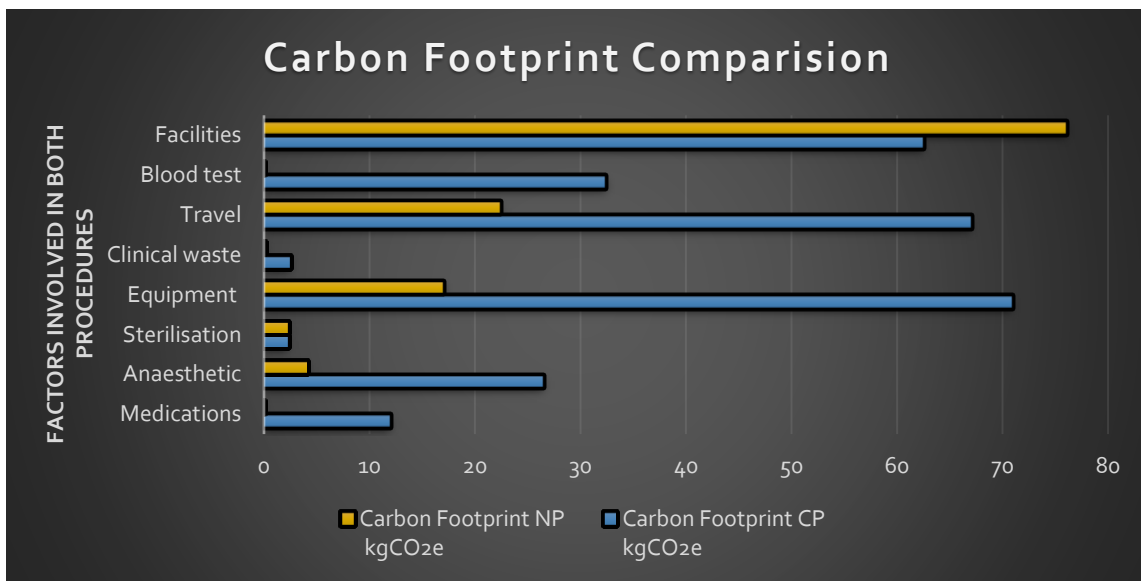


Figure 2: Carbon Footprint comparison (kgCO<sub>2</sub>e) between the two pathways

*Financial benefit:*

From the inventory spreadsheet, the expenses incurred were calculated for various consumables. The total cost of performing biopsies in theatre under general anaesthetic has costed £726 and on the contrary Office Based Biopsy cost £179 showing a net savings of £547.

#### *Clinical and health outcomes:*

This project successfully met the initial targets of reducing bed occupancy and better utilisation of theatre time. This service has helped both patients, relatives whilst also promoting for staff well-being.

Although not specifically measured in this project, but pertinent to CTM UHB, people from more deprived areas are not only more likely to get cancer, but they are also more likely to be diagnosed at a late stage for certain cancer types (Roberts, 2023). Reducing waiting times and improving accessibility are important strategies to help address this.

#### *Social sustainability:*

Patients have expressed great satisfaction through verbal comments and have sent written compliments after receiving service at this clinic. The patients also felt that this service is very convenient for them as they do not need to undergo the stress of admission process and general anaesthesia. We have applied for formal Patient Reported Outcome Measures (PROMS) and Patient Reported Experience Measures (PREMS) for obtaining formal feedback.

#### **What steps have been taken to ensure lasting change; how it could be spread to other contexts and suggest next steps to do so.**

At CTM UHB ENT department in 2021-2022, there were an estimated 50 procedures carried out in the outpatient department using the novel pathway over one year. This special clinic is currently scheduled once every 2 weeks. It is possible that 12% of the entire waiting list for ENT operations can be carried out under this novel pathway. If the clinic frequency is increased to 2 clinics per week, an estimated 300 to 350 outpatient biopsies can be done in the outpatient clinic per year. There are a variety of other procedures done in the clinic in addition to Micro laryngoscopy and biopsy. In this study we have calculated the economic and carbon footprint savings only for Micro laryngoscopy and biopsy. Over a time period of one year, the cost of savings for carrying out 300 procedures in the novel pathway can amount to £164,112 This was calculated by deducting the cost of the novel pathway (£179.01) from the conventional pathway (£726.05) and multiplied by 300. Using the same calculations for carbon footprint, we can infer that a saving of 46,245kgCO<sub>2</sub>e can be saved per year.

The quantitative and qualitative data on social benefit assessment is yet to begin. It is obvious that this service has made great impact on patients' and their relative's quality of life and contributed for staff wellbeing.

## ACKNOWLEDGEMENTS

CSH would like to thank all the scholars for their enthusiasm, dedicated work & creativity in their project work: Charlotte Pritchard, Dr Esther Tobarra-Sanchez, Joanne Sullivan, Rhiannon Facey-Richards, Dr Tom Downs and Seshagiri Rao Pasunuru.

We are indebted to Elle McNeil for attracting the funding and setting up the programme, alongside Sian Watkins, Leanne Morrish and the CTM UHB Improvement team, Rachel Heycock and Paul Gimson, for support given to the scholars throughout the programme period.

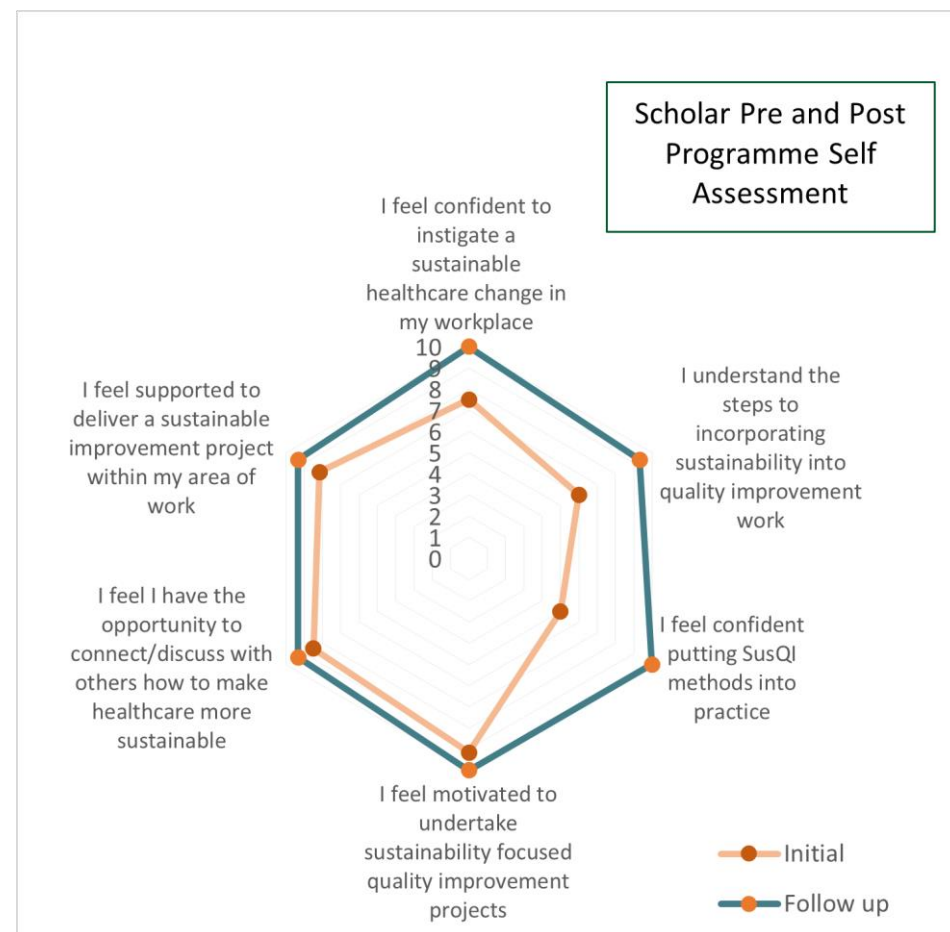
We wish to thank the CTM UHB Local Sponsors, who provided time, interest, local knowledge and expertise: Tom Powell, Russell Hoare, Philip Daniels, Emma Williams, Victoria Wallace and Abigail Morris.

We thank the CSH Supervisors Ingeborg Steinbach, Carbon Consultant; Rosie Hillson, Carbon Modelling Assistant, Catherine Floyd, Clinical Specialties Lead.

## CONCLUSIONS & RECOMMENDATIONS

### Conclusions

This programme has overseen the development of six scholars in a wide variety of healthcare settings. Whilst most scholars are still to complete the full PDSA cycle as the programme ends, there is commitment by these individuals to do so and to share their learning. Protected time was seen as a key contributor to scholar progress.



The main strengths of the programme have focussed on contributions from the front line to the evidence base for environmentally and socially sustainable healthcare services and accelerating innovation/adoption of sustainable practices in healthcare. It is particular pleasing to see that two scholars have made such progress in known carbon hotspots, i.e. anaesthetics and respiratory inhalers.

The condensed programme has reduced the amount of time scholars have had to take their change proposals through to delivery.

Nevertheless, scholars report positively on their experience: they have improved their understanding of, and confidence in, applying sustainable quality improvement. They also say they feel more motivated to undertake sustainability focused quality improvement projects in the future.



## Recommendations

1. Graduating scholars should be encouraged to maintain their newly formed networks and focus on completion of their PDSA cycles, learning, embedding and spreading across the organisation. CTM UHB could usefully take steps to maintain this group of scholars as a resource for wider staff development.
2. To capitalise on the potential for mutual support, future programmes would do well to develop projects where more than one scholar could work together, or in parallel in similar settings, in known hotspot areas.
3. There were mixed views about whether the programme was long enough to complete the projects. If repeated, and kept to the same length, perhaps consideration could be made to restricting the project's focus to an issue within their immediate work environment and within the scholar's immediate locus of control.

**When asked which part(s) of the programme they found most useful, one scholar said:**

*"All of it. The project would not have been achievable without the protected time. It was so nice to meet up with the cohort, share experiences and progress, and discuss our projects with like-minded people. Writing the report really helped to solidify the learning and identify gaps, and the feedback on the report has been invaluable and I think a really important part of the learning."*

*Scholar*

*"Really good to have opportunities to offer the team to develop new skills"*

*Local sponsor*

*"My scholar really enjoyed the programme and felt it met their needs and gave them an opportunity to network with colleagues, no suggested changes."*

*Local sponsor*



## APPENDICES

### APPENDIX 1 – Scholars' overall evaluation and post programme self-assessment

Five scholars would recommend the Intensive Sustainable Innovation scholar programme to others.

*"The well-structured programme ensured I had dedicated time in my work week to explore my project. The two modules at the beginning of the process provided a good starting point from which to learn. The support we had from CSH was excellent - I felt valued and enabled to develop at my own pace. As a group of CTM Sustainable Scholars, we were given plenty of time to share with each other our learning, successes and challenges - this enabled us to support each other."*

One scholar said *"I would recommend the programme based on the person and what they wanted to get out of it. I wouldn't recommend it to everyone."*

**The programme involved being in a learning cohort, attending training, CSH group and individual supervisions, CTM meet ups/support, having a local sponsor, having protected time, doing a project, presenting the results and writing up a report.**

**When asked which part(s) of the programme they found most useful, scholars said:**

*"I found each part was most useful. The parts rolled into one another smoothly. It was important to have a local view, as well as one from the bigger picture. If I had to choose one part, I found especially that meeting CSH supervisor very useful as they helped me keep to target timescales and was most encouraging."*

*"All of the above. The project would not have been achievable without the protected time. It was so nice to meet up with the cohort, share experiences and progress, and discuss our projects with like-minded people. Writing the report really helped to solidify the learning and identify gaps, and the feedback on the report has been invaluable and I think a really important part of the learning."*

*"The most valuable part of the project was having the time and space to carry out sustainability work in my health board. The trust from the health board to explore ideas with protected time to try them out was valuable for me."*

**When asked about barriers to implementation**, scholars mentioned getting information from some CTM UHB and business staff, timing over Christmas, shift work and competing priorities.

Half of scholars felt that the programme was too short, half felt it was about right.

**Other comments included:**

*"Thank you. I have been educated, inspired and energised re mitigating climate change through NHS project work"*

*"The scholarship was good. However, it was quite individually focused, it would have been good to feel I was doing the work more as part of a team working on sustainability in CTM UHB rather than on my own"*

*"This scholar programme has been a great experience in last 6 months. The programme was very well organised from start to finish. The help from CTM and CSH staff is exemplary. The mandatory courses are so valuable. The personal attention that I got from XX and YYY is so precious and every meeting with them was so fruitful in completing my scholar targets. Thanks a lot to both of them and everyone involved"*

**Post programme scholars' self-assessment, demonstrating change over the 6 months:**



**APPENDIX 2 –Scholars’ evaluations of the two on-line courses**

The courses were reviewed very positively by the scholars both in terms of content and usefulness in helping them prepare for their projects.

**Course one - Sustainable Quality Improvement**

100% agreed or strongly agreed that the material was clearly organised and presented, easy to understand, and helpful for developing ideas for SusQI projects in my workplace.

*“I found the introduction helpful especially videos. Helped to understand the scale of the problem. Also found the resources very helpful”.*

*“I did not get a chance to review all the material prior to the course today but I will certainly use it as the project progresses”.*

*“I can study at my own time”.*

*“Maybe 2 sessions rather than 1 x 5 hour session, it is too long on TEAMS”* [post survey note, the session was 4 hours, although it obviously felt longer to this scholar]

100% strongly agreed that they felt equipped to take the first steps in carrying out a SusQI project and 100% would recommend the course to a colleague.

## Course 2 – Carbon footprinting for sustainable healthcare

100% agreed or strongly agreed that the material was clearly organised and presented, easy to understand, and helpful for developing ideas for projects in my workplace.

*“I found all of it useful, but examples of previous projects help to consolidate the ideas and also the additional reading, I am finding the Bananas book very useful”.*

*“Links to studies already carried that had carbon foot-printed different aspects of healthcare”.*

*“Discussing project and hearing about other projects”.*

*“It was actually really useful. I did a susQI course and I was a bit scared with the carbon footprint element of calculations...”*

*“Learning from experts, and having our questions answered”.*

## APPENDIX 3 – Local Sponsors’ Evaluation

The aims of this Intensive Sustainable Innovation Scholar Programme are to

- create a community of practice and increase knowledge about sustainability challenges and solutions in healthcare
- gain strategic influence, spread good practice and grow the next generation of leaders in sustainable healthcare
- to deliver a sustainable improvement project within their area of work.

100% of supervisor respondents felt their scholar had benefitted very well or outstandingly from the programme. All supervisors felt that their scholar had met the programme aims reasonably or very well, 40% of supervisors felt their scholar had met the scholar programme aims outstandingly.

### When asked if there were any changes to the programme, responses included:

*“Given the timescale, I feel that it is fine”.*

*“XX really enjoyed the programme and felt it met their needs and gave them an opportunity to network with colleagues, no suggested changes.”*

*“Perhaps to firm up the project within a specific timescale?”*

*“Maybe link to a strategic lead?”*

80% of sponsors felt the programme was about the right length, 20% felt it was too short.

### Other comments:

*“Really good to have opportunities to offer the team to develop new skills”.*

*“We've had a great outcome from the programme”.*

*“Excellent program that my scholar thoroughly enjoyed”.*

## **APPENDIX 4 – The Centre for Sustainable Healthcare Perspective**

**Engagement by the 6 scholars** with the training and group and individual supervisions has been **excellent**. The enthusiasm and commitment of scholars, despite pressure on front line services, was notable. **Access to local sponsors appears also to have been key in enabling the scholars to find their feet**. Project topic areas have mostly been within the setting in which the scholars are working, from theatres to primary care. However, two scholars chose projects set outside their immediate working environment, appertaining to the wider determinants of health.

**The support of a local coordinator to link in CHS plus the provision of extra meetings for the scholars was overall helpful**. There was some confusion initially about scholar paperwork duplication between CSH and the CTM “sides”, which was dealt with swiftly.

**This programme was sun over 6.5 months, shorter than the usual 12 month, programme**. Most scholars have not had time to fully complete a PDSA cycle within the shorter programme. Those scholars choosing project areas outside of their immediate working environment also found, understandably, that things took longer than expected “to get going”. In a shorter time-frame, choosing projects and managing expectations is key, particularly when it comes to planning recruitment and selection of project areas outwith the scholars’ own area of work.

Most CSH group scholar programmes have been specialty based, spanning UK. This is the second time CSH has run the programme in one geographical area. It is notable that several scholars particularly appreciated the local comradery this enabled. The possibility of light touch on-going support definitely gives **an opportunity to build a community of practice at an organisational level with on-going influence**.