**Health Impact Analysis of**

**Lancashire and South Cumbria ICB’s**

**Green Plan Actions - Towards Meeting Net-Zero**

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# Executive Summary

**Sustainable Models of Care**

The necessary reduction in the environmental impact of healthcare involves changes in care pathways, specialties, and materials, as well as embracing new technology. However, the key to improved outcomes alongside a lower carbon footprint and cost efficiency, is a shift from treatment to prevention. Community Diagnostic Centres (CDCs) are essential for this shift, but they must be properly staffed and have a focus on preventive care. Targeted health promotion can help reduce disparities and improve the health of vulnerable populations, and building trust and empowering communities are vital components for achieving this. Lowering the risk of disease, not simply increasing medical interventions, calls for a healthcare system that prioritises prevention, equity, and sustainability, while leveraging the potential of CDCs and technology.

**Food and Nutrition**

It is important to understand food poverty and insecurity to effectively promote healthier diets such as plant-based diets. It is also vital to align dietary advice, with nutritional guidelines for chronic conditions like diabetes, and this may involve increased amounts of consultation with registered dietitians. Partnerships between organisations and the use of digital tools, can help to promote healthier eating which aligns with net zero goals. Hospital catering can lead by example in this area.

**Digital Transformation**

Digital transformation in healthcare offers significant potential for improved patient outcomes. Virtual appointments and online consultations enhance access and convenience. However, challenges such as the digital divide, patient preference for face-to-face interaction, and potential for underdiagnosis need to be addressed. While new technologies like wearable sensors show promise for patient monitoring, the online environment can also lead to negative consequences such as cyberchondria, decision fatigue, and delayed treatment. To maximize the benefits of digital healthcare, it's crucial to balance the advantages with the risks and to ensure equitable access for all patients.

**Travel and Transport**

Improved public transport and active travel to promote net-zero goals, can enhance healthcare access and overall well-being. Better public transport links to healthcare facilities (including CDCs) typically improve access for underserved communities, which can lead to more timely treatment and increased engagement with centralised preventative care. Additionally, promoting cycling and walking to reduce car pollution can simultaneously improve public health. However, creating safe cycling and walking routes, which separate cyclists and pedestrians from car traffic, is crucial for the success of these initiatives.

**Medicines**

Green inhalers can reduce greenhouse gas emissions and improve medication adherence, but their suitability depends on individual patient needs. N2O reduction can also benefit patients by reducing side effects, but the use of alternatives to N2O, must be balanced against N2O’s well established safety and effectiveness. Mobile destruction units could help mitigate against N2O emissions. To effectively implement these changes, national guidance, standardisation, and training for healthcare professionals are essential.

Medication use reviews are a valuable tool to reduce waste, optimise prescriptions, and improve patient health, particularly for older adults. Such reviews are already supported by the Lancashire Medicines Management Group (LMMG). This tool is not listed as one of the actions in the ICB Gren Plan, although the plan suggests a move away from polypharmacy, towards self-care and social prescribing to prevent medicines waste.

**Procurement and Supply Chains**

Sustainable procurement in healthcare is a complex but essential process, which offers benefits for patients, staff, and the environment. However, careful consideration must be given to both health and environmental factors. This includes thorough product research, prioritising reputable suppliers, and adhering to certifications and national guidance. The mandate for a 10% weighting of social value in procurement contracts is a positive step, but it is crucial to balance social impact with clinical outcomes; and avoid disadvantaging clinically effective providers who are smaller in size, and less adept at evidencing social value.

**Building Energy and Capital Projects**

Community renewable energy initiatives and switching to green gas sources like biogas, can bring substantial benefits, including job creation, lower energy costs and community funds, as well as improved health through reduced air pollution. Collaboration, education, and financial innovation are key to their success.

**PPE Usage and PPE Waste**

Reducing PPE usage requires a careful balance between reducing waste, ensuring patient and staff safety, and maintaining levels of comfort and confidence. Reusable medical gowns offer a potential solution for environmental and health benefits, as well as patient and staff acceptability.

**Green Space and Biodiversity**

Green space improves air quality, reduces stress, and promotes physical activity. It also helps mitigate against heat-related illnesses and creates a sense of community. Healthcare professionals should be knowledgeable about the benefits of "nature prescribing" and prioritise green space initiatives in low-income areas. Biodiversity can also improve health; it reduces the risk of zoonotic diseases by creating barriers between wildlife and humans. However, careful assessment is necessary to minimise potential risks associated with increased biodiversity.

**Climate Adaptation**

Climate change adaptation is crucial for population health and for maintaining healthcare service continuity. The primary focus should be on preparing for heatwaves due to their significant impact on public health, particularly among vulnerable populations. Improving public education, infrastructure, and building insulation are essential measures; and healthcare facilities such as care homes, must adapt to rising temperatures. Upgrading buildings to withstand heat and improving indoor temperature control can enhance population health and well-being, however, financial and technical challenges need to be addressed.

Preparing for flooding is also vital. This requires ensuring continued access to healthcare services during floods; developing evacuation plans; and improving collaboration between agencies.

As climate change anxiety (CCA) grows, mental health services must be available to help people cope with both CCA and the emotional impact of extreme weather events.

### Overarching Recommendation

During the re-iteration of the ICB Green Plan (required by April-25), consider the health impacts, challenges and examples identified within this report. This should help prioritise areas of focus, such as collaboration with other organisations, including overcoming barriers to such, and ensuring Green Plan actions increase health improvement opportunities for those most in need, thus narrowing existing health inequalities.

### Further Recommendations

1. Given that people with poorer health have higher NHS carbon-footprints (healthcare utilisation, energy-intensive treatments, medication production/transportation and waste), preventative healthcare is the ultimate way to save carbon while positively impacting patients.

Through targeted health promotion and community empowerment, greater prevention can be achieved. Better use of technology and appropriate utilisation of community diagnostic centres can help achieve this.

1. In order to reduce health inequalities, in line with ICB principles, equity of access must be encouraged during the promotion of:
   1. carbon-friendly (and healthier) net-zero diets
   2. digital tools
   3. greener transport options
2. Clinically advised polypharmacy reductions are known to benefit patients and while this is noted in the current Green Plan, it ought to be referenced as a specific action. The risks/benefits of introducing greener equipment, devices, medicines, inhalers, analgesia and even packaging, may be more complex. It is important that national guidance and advice is adhered to, and that evidence-based certifications are checked. Novel approaches which minimise impacts on patients should be prioritised.
3. Public education, infrastructure and building insulation, are essential measures in adapting to rising temperatures. Vulnerable populations such as those living in care homes, must be prioritised when promoting climate adaptation.
4. Health impacts, challenges and examples identified within this report, should be considered during the production of other ICB strategies/action plans, regardless of whether they have a Net-Zero focus or not.

# Introduction

Balancing environmental benefits with potential health risks is crucial for achieving sustainable and health-promoting net-zero actions. In conducting this Health Impact Analysis (HIA), a combination of procedures, methods, and tools were used to judge the ICB’s Green Plan. Specifically, the 89 actions in the green plan, were investigated as to their potential effects on population health, including the distribution of those effects – inequalities.

# Scope

Within the scope of the plan, were actions relating to:

* Workforce and System Leadership
* Sustainable Models of Care
* Digital Transformation
* Travel and Transport
* Estates and Facilities
* Building Energy
* Capital Projects
* Water
* Waste
* Green Space and Biodiversity
* Medicines
* Supply Chain and Procurement
* Food and Nutrition
* Climate adaptation

What was NOT in scope, was the indirect impact on health from our contribution to carbon reduction and climate change, and the health impacts of climate change on our population (modelling for the latter is performed at a national level).

# Methodology

Each of the 89 actions in the green plan, were screened using the following questions:

Can implementing the action:

1. Directly impact on peoples’ health, mental health and wellbeing?
2. Impact on social, economic and environmental living conditions that may indirectly affect health?
3. Affect individuals and their ability to improve their own health and wellbeing?
4. Affect levels of demand or access to health and social care services?

The 31 actions which answered Yes to one or more of the questions above, were each investigated for their potential impacts on health. This was primarily a desk-top exercise, but also involved attending workshops, forums and steering group meetings.

# Actions, Impacts and Challenges

# 1.0 Sustainable Models of Care

## 1.1 Plans for the National Elective Recovery Programme

**Action:** Develop an Accredited National Pathway Improvement Programme (NPIP) and ‘Getting It Right First Time’ Plans for the National Elective Recovery Programme.

### 1.11 National Pathway Improvement Programme (NPIP)

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Prioritisation of prevention, early intervention, and chronic disease management  ▪ More efficient use of resources  ▪ A greater focus on the social determinants of health  ▪ Empowering individuals and groups  ▪ Strengthening community interventions | ▪ Traditional healthcare focuses on quick solutions  ▪ Siloed structures  ▪ Securing dedicated resources for prevention (e.g., technology and training)  ▪ Collaboration needed across healthcare sectors and other relevant agencies |
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| **Possible Negative Impacts** |
| ▪ Preventative and self-care, not attracting those in greatest need  ▪ Limiting autonomy  ▪ Overdiagnosis and overtreatment driven by treatment targets, e.g., statin prescribing guidelines are evolving to offer more flexibility, yet evidence suggests they are already overprescribed [[1]](#endnote-2)  ▪ "One-size-fits-all" approach  ▪ Discouragement of local innovation |

**Example(s) of Good Practice**

**1. National Cardiac Pathways Improvement Programme (CPIP)**

Early data suggests increased detection of atrial fibrillation (AF), a leading cause of stroke **[[2]](#endnote-3)**. Preventing strokes positively impacts patient health, but may also simultaneously lower the future carbon footprint, such as future extended hospital stays, intensive care, and stroke rehabilitation.

**2. RightCare Pathway: COPD**

RightCare Pathways provide a national case for change and a set of resources to support Local Health Economies. In 2017, it was estimated that £49m could be saved if CCGs achieved the emergency admission rate of their best 5 peers **[[3]](#endnote-4)**.

### 1.12 ‘Getting it Right First Time’ (GIRFT)

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Reduced diagnostic errors  ▪ Minimised treatment delays  ▪ Reduced complications  ▪ Increased trust and satisfaction  ▪ Greater empowerment and self-managing  ▪ Reduced stress and anxiety | ▪ Real-time access to accurate and comprehensive patient data  ▪ Coordination across healthcare professionals and specialties  ▪ Continuous learning, upskilling, and adapting pathways |
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| **Possible Negative Impacts** |
| ▪ Possible de-emphasis on individual histories and concerns  ▪ Extra stress to clinicians, potentially impacting on decision-making and stifling innovation and learning |

**Example(s) of Good Practice**

**1. Acute and General Medicine (AGM):**

A GIRFT review, has led to recommendations around areas such as workforce, and some specific recommendations around efficiency. For example, the review found that sepsis may be over-diagnosed by as much as 25% (due to being diagnosed as a precautionary measure). Strategies to ensure that patients presenting with sepsis are identified accurately and treated safely have been published [[4]](#endnote-5).

**2. Interactive pathways to support care for patients with diabetes**

Interactive versions of three GIRFT pathways for diabetes are now available to support NHS colleagues, demonstrating examples of the processes and key decisions that need to be worked through to offer best practice to patients in their care [[5]](#endnote-6).

## 1.2 Community Diagnostic Centres (CDCs)

**Action:** Support the Development of the Community Diagnostic Centres (CDCs) Across the Region

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Improved access to diagnostics  ▪ Faster diagnoses and treatment  ▪ Reducing pressure on hospitals  ▪ A more patient-centred environment  ▪ Improved access to diagnostics in underserved communities  ▪ Employment-related health benefits  ▪ Increased public health capacity  ▪ Strengthened community well-being | ▪ Staffing Challenges for CDCs (existing staff spread between locations) [[6]](#endnote-7)  ▪ Potential Fragmentation of Care (inadequate integration with services and more complex navigation of systems patients)  ▪ Access challenges e.g., transportation links to new centres  ▪ Unexpected downside of location e.g., worse pollution and traffic congestion  ▪ Realising the vision of doing diagnostics differently, otherwise there is a risk that CDCs are side-lined or scaled back [[7]](#endnote-8) |
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| **Possible Negative Impacts** |
| ▪ Over-referral by healthcare providers, particularly for low-risk conditions or anxiety-driven concerns  ▪ Increase air pollution related health determinants near sites due to traffic increases  ▪ Potential increase of road traffic accidents (RTAs) near sites |

**Example(s) of Good Practice**

1. **Whitegate Drive Health Centre CDC in Blackpool**

This CDC serves patients referred by local GPs for various diagnostic needs (x-rays, ultrasounds, MRIs, CT scans, and blood tests). The centre offers shorter wait times compared to hospital-based services, particularly for radiology, and a HealthWatch survey showed that all attending patients were either very satisfied (75%) or satisfied (25%) [[8]](#endnote-9).

1. **Other CDCs in Lancashire and South Cumbria**

Other CDCs in LSC have been established in Preston, Kendal, and Rossendale (relieving pressure on LTHTr, UHMBTr and ELHTr respectively). These have significantly improved access, travel distances and waiting times for those in more rural communities such as the Rossendale Valley. This promotes greater equity in healthcare provision [[9]](#endnote-10).

## 1.3 Access to Care in Areas of Deprivation

**Action:** Work with Local Authorities, PCNs and the Voluntary Sector to Improve Access to Care in Areas of Deprivation (Transport, Signposting, Community-Based Initiatives)

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| **Positive Impacts on Patient Health** | **Challenges** |
| Accessibility being improved by:  ▪ Public transport improvements  ▪ Broad reaching forms of communication  ▪ Community-based initiatives  ▪ Mobile clinics / temporary pop-up clinics  ▪ Partnerships with local organisations  ▪ Health education and outreach | ▪ Tackling underlying issues like poverty, unemployment, food insecurity, and housing  ▪ Securing long-term funding, involving volunteers, and partnering with the private sector  ▪ Monitoring and evaluating the impact of these interventions |

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| **Possible Negative Impacts** |
| ▪ Over-diagnosis (finding low-risk conditions not necessarily needing treatment, and treating such)  ▪ Over-reliance on medical system (stifling prevention, self-care, VCFSE and healthy lifestyle choices) |

**Example(s) of Good Practice**

1. **Lancashire and South Cumbria (LSC) Enhanced Health Checks**

Enhanced health checks (EHCs) focus on closing health inequality gaps by targeting the most vulnerable people and those living in the most disadvantaged communities. The EHC incorporates a focus on the wider determinants of health and links closely with social prescribing and the third sector [[10]](#endnote-11).

1. **Fylde Coast Medical Service (FCMS) – Health Bus**

The health assessment bus was introduced post-pandemic as a way to clear backlogs of people who were reluctant to make an appointment for a health check-up during Covid-19 restrictions [[11]](#endnote-12). Nationally, there is evidence that initiatives such as this increase early detection and intervention, awareness of preventative measures and health resources and increase trust with a breaking down of barriers to healthcare access in deprived areas [[12]](#endnote-13).

## 1.4 Decarbonising Pathways and Specialties

**Action:** Work with Local Clinicians to Consider how Care Pathways/Specialties can be Decarbonised

A care pathway is “a complex intervention for the mutual decision-making and organisation of care processes for a well-defined group of patients during a well-defined period” [[13]](#endnote-14).

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Knowledge sharing and best practice  ▪ Increased public awareness & engagement  ▪ Enhanced innovation and research | ▪ Specific impacts of collaboration will depend on the nature of the partnerships, the level of engagement, and the resources available |

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| **Possible Negative Impacts** |
| ▪ Highlighting negatives without benefits creating anxiety and fear  ▪ Social conflict about plans  ▪ Public resistance e.g., costs |

**Example(s) of Good Practice**

1. **Use of Sustainable Healthcare Coalition (SHC) Guidance and the Care Pathway Carbon Calculator**

SHC guidance on ‘Appraising Sustainability’ has been published due to the growing interest in quantifying and reducing the impact of care pathways. It should be used to incorporate sustainability into decision-making when designing new care pathways, or to understand sustainability considerations when optimising existing care pathways [[14]](#endnote-15). The Carbon calculator makes use of carbon footprint data to help provide a rapid and simple means to produce some indicative numbers on carbon emissions associated with care pathways.

1. **Lancashire and South Cumbria ICB 10-point plan for Practices**

A 10-point plan has been developed by the Lancashire and South Cumbria ICB alongside primary care colleagues, to help guide practices to reduce their environmental impact. The aim of the plan is to encourage GP practices to align themselves with the NHS’ net zero ambitions. For instance, 48% of general practice’s carbon footprint comes from the prescribing of pharmaceuticals, and one part of the 10-point plan suggests greater consideration of non-pharmaceutical medical interventions such as green social prescribing or increasing physical activity, as alternatives to drug treatments. The plan is outlined in appendix 1 [[15]](#endnote-16).

## 1.5 Decarbonisation of Care Materials

**Action:** Develop Decarbonisation of Care Materials and Disseminate to Place-Based Partnerships

Over 1.4% of supply chain emissions are due to single-use devices, some of which could be refurbished and reused, saving both carbon and money [[16]](#endnote-17).

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Potential for improved care materials e.g., bio-compatibility of bio-based polymers for use in drug delivery systems (DDS), coatings for biomedical devices, and wearable sensors [[17]](#endnote-18)  ▪ Reduced exposure to harm from chemicals such as BPA and phthalates when using natural products, integration of biopolymers into medical products is correlated with reductions in carcinogenic impacts, non-carcinogenic impacts and respiratory effects [[18]](#endnote-19)  ▪ Anti-microbial properties of natural fibres such as bamboo and hemp  ▪ Patient feedback can maximise benefits and functionality of new products being developed | ▪ Higher cost of sustainable alternatives  ▪ Transparency and communication between health providers and patients  ▪ Collaboration between healthcare providers, manufacturers and policy-makers to ensure trust and understanding  ▪ Research in areas such as effectiveness, safety, degradation rates, stimuli-responsiveness, biodegradability and biocompatibility |

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| **Possible Negative Impacts** |
| ▪ Sustainable materials might be more expensive than traditional options, leading to increased healthcare costs  ▪ Limited availability may result in inequity in provision  ▪ Performance and safety uncertainty may undermine confidence of patients and clinicians |

**Example(s) of Good Practice**

For bio-based inhalers see ‘5.0 Medicines’. For sustainable packaging see ‘6.0 Supply Chain and Procurement’

1. **The Born Green Generation Movement**

The Born Green Generation Movement is a partnership of European hospitals aiming to reduce the use of harmful plastics and phase-out toxic chemicals in maternity, neonatal and paediatric wards. Exposure can lead to severe and lasting health issues, from chronic diseases, diabetes and even cancer, as neo-natal defence systems are not yet developed [[19]](#endnote-20).

1. **Lancashire and South Cumbria ICB Formulary for Wound Care Products**

Products made from alginate (a natural polymer that exists widely in many species of brown seaweed) are used as fillers for medium to high exuding wounds. The ICB wound care formulary, recommends Alginate based products as first line hospital and community treatments, due to their ability to regulate water content, and their strength, flexibility [[20]](#endnote-21).

## 1.6 Targeted Health Promotion

**Action:** Work with Place-based Partnerships to Produce Targeted Campaigns for Healthy Eating, Smoking Cessation, and Elderly Care, with Accompanying Signposting to Services

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Increases in the levels of healthy eating  ▪ Decreases in the level of smoking  ▪ Improved knowledge of families and caregivers about the benefits of net-zero alternatives, tax breaks and grants (e.g., energy upgrades)  ▪ Greener options increasing choice in health promotion support services  ▪ Potential long-term financial gains by care facilities implementing sustainable practices | ▪ Ensuring health promotion campaigns are equity-focused with high accessibility  ▪ Monitoring and evaluation of strategies  ▪ Alignment with upstream interventions addressing health inequality root causes  ▪ Tailoring to specific cultures and beliefs  ▪ Collaboration with the public and other trusted entities, to build engagement and trust with marginalised populations |

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| **Possible Negative Impacts** |
| ▪ Prioritising products with a low carbon footprint may lower clinical effectiveness, compared to effective carbon-unfriendly alternatives e.g., biodegradable nicotine gum versus vaping products [[21]](#endnote-22)  ▪ The Inverse Care Law proposes that those most in need of healthcare are least likely to receive it, due to issues such as access and awareness [[22]](#endnote-23), this is especially the case with health promotion activities and self-care promoting initiatives, which are often seen as attracting the better educated |

**Example(s) of Good Practice**

1. **Blackburn with Darwen Pharmacy-based Smoking Cessation**

Pharmacies are widely available, often within walking distance for many residents. The positive pharmacy care law implemented in 2013, has seen increased access to pharmacy-led healthcare services, particularly for individuals in underserved areas or facing transportation challenges. Blackburn with Darwen (BwD) offers a pharmacy-led smoking cessation service, and 8 out of the 14 pharmacies that offer smoking cessation services, are located in BwD’s most deprived areas. Self-reported quit rates at BwD are 57%, compared to the Lancashire average of 53%, while carbon-monoxide verified quit rates are massively above the Lancashire average for this time period (40% versus 7%) [[23]](#endnote-24).

1. **Cumbria County Council new model of care for elderly people**

Cumbria County Council is working with partners to implement a new model of care for elderly people [[24]](#endnote-25). The service model consists of the following basic elements:

* Mobile domiciliary care and support services available across geographical areas
* Greater use of community alarm and Telecare services backed up by a response service, 24/7
* Mobile technology to be used to alert workers in emergencies, and provide service user information, etc.
* The use of NHS telemedicine to monitor a person’s vital signs from home

# 2.0 Food and Nutrition

## 2.1 Plant-forward Diets

**Action:** Promote Plant-Forward Diets Across the ICB

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Reduced risk of chronic diseases such as cardiovascular disease, type 2 diabetes, and certain cancers [[25]](#endnote-26)  ▪ Improved weight management  ▪ Better gut health, improving overall health, for example skin health [[26]](#endnote-27)  ▪ Potentially reduced risk of allergies and autoimmune diseases, although more research is needed in this area  ▪ Generally, plant-based diets fit well with diabetes, and dietary need, being lower in saturated fat, higher in fibre, and other protective substances [[27]](#endnote-28) | ▪ Plant-based diets are often viewed by the public as an 'all or nothing' approach  ▪ Addressing social and economic barriers to healthy eating through policies and community initiatives  ▪ Debunking myths about plant-based diets lacking in nutritional value  ▪ Monitoring the diets of people with chronic disease, and adjusting medication accordingly e.g., metformin for diabetes as per MHRA guidelines [[28]](#endnote-29)  ▪ Re-branding plant forward to make them more appealing, for instance increasing knowledge of improved 'skin health' and ‘gut health’  ▪ Utilising levers such as the 30-plant points challenge |

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| **Possible Negative Impacts** |
| ▪ Poor access and affordability can impact people financially & mentally  ▪ If unbalanced, e.g., only for weight loss, can cause nutrient deficiencies plus other unhealthy eating habits  ▪ People may experience low blood sugar levels, low blood pressure, or rapid weight loss. In particular people with chronic disease |

**Example(s) of Good Practice**

1. **East Lancashire Hospital Trust** introduced an extensive vegan menu for its patients in 2018. It also runs meat-free Mondays every week at the Trust. The Trust is also set to use the new NHS England recipe bank of 300 low carbon dishes which has recently gone live. Each recipe can be displayed to patients with ‘FoodPrints’ displaying carbon values. Clearly, this provides a menu nudge to patients, perhaps promoting a sense of patient empowerment.
2. **Plant Based Health Professionals UK** is a community Interest company dedicated to providing education and advocacy on whole food plant-based nutrition, for prevention and treatment of chronic disease. [[29]](#endnote-30).

## 2.2 Digital Menus

**Action:** Support the Roll Out of Digital Menus Across our Member Organisations

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Integration of menus with educational resources  ▪ Detailed nutritional information  ▪ Calorie counts and portion size visualisations  ▪ Tailoring to individual dietary needs, including integration with the electronic patient record  ▪ Can provide transparent information about food  ▪ Better communication (including different languages) and feedback, reducing errors and improving menu offerings (including catering for different cultures)  ▪ Menu nudges can incorporate other wellbeing messages | ▪ Data privacy and security of personal dietary information  ▪ Patient trust in the ethical use of data  ▪ Offering dietary information in a non-judgemental way, and in a way that patients do not feel manipulated or patronised  ▪ Exposing gaps in current processes |

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| **Possible Negative Impacts** |
| ▪ Digital exclusion (see 3.0)  ▪ Lower opportunities for informed sociable advice on food, potentially causing more social isolation  ▪ Overemphasis on calorie counts or portion sizes, might shift focus from mindful eating and enjoying food, to disordered eating behaviours |

**Example(s) of Good Practice**

1. **University Hospitals of Morecambe Bay NHS Foundation Trusts (UHMBFT)** digitalised its patient meal ordering service in 2017, halving food waste and reducing printing costs by £190,000 annually [[30]](#endnote-31). The previously admin-heavy task is now streamlined freeing up nursing time and increasing patient satisfaction. The digital process allows real-time updates on dietary requirements, portion sizes and allergies as necessary.
2. **Barts Health NHS Trust** report that digital ordering improves the service they give to their patients, for example paediatric dieticians use the technology to create bespoke controlled diets for children with special needs and to balance the low energy/high protein requirements of children with reduced mobility [[31]](#endnote-32).

## 2.3 Food Insecurity

**Action:** Interact with Place Based Partnerships and VCFSEs to Understand the Causes and Extent of Food Insecurity Across the Region.

**And**

## 2.4 Food Poverty

**Action:** Contribute to a Review of Food Bank Use and Investigate Patterns of Food Poverty.

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Better tailoring of resources and programs to address specific needs  ▪ Avoiding a "one-size-fits-all" approach and offering more effective solutions  ▪ Addressing systemic issues like poverty, housing instability, and access to healthy food options can create lasting improvements | ▪ Reaching and engaging with the those suffering from food insecurity and food poverty  ▪ Overcoming barriers such as trust, language engagement and accessibility  ▪Time, funding, and personnel constraints can limit the ability to conduct in-depth and inclusive research and engagement |

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| **Possible Negative Impacts** |
| ▪ Power dynamics can challenge the hearing of all voices meaning important issues can be missed  ▪ Poor understanding of issues, can lead to sub-optimal directing of resources |

**Example(s) of Good Practice**

1. The Health Determinants Research Collaboration (HDRC) is a five-year project running to 2025 and is grant funded by the National Institute for Health and Care Research (NIHR). It has awarded funding to Blackpool Council and its partners, who aim to explore what they can do to improve the overall health of the community. There is a strong focus on health inequalities, and social determinants of health such as food insecurity.
2. West Lancashire Borough Council (WLBC) commissioned research on food insecurity to inform the potential development of preventative, sustainable and cost-effective policy solutions in 2021.

## 2.5 Healthy Eating Partnerships

**Action:** Establish Healthy Eating \* Partnerships with Partner Organisations and Councils

\* Partnerships could include the British Nutrition Foundation, the ‘Collaboration for Kids’ charity, and contract caterers in the education sector.

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Diverse expertise and resources, promote increased knowledge and access to healthy eating, shared goals and shared challenges, and foster a sense of mutual support  ▪ Collaboration can reduce costs of healthy foods and create solutions for diverse needs and cultural preferences  ▪ Collaboration can nurture community empowerment, increasing the likelihood of groups adopting healthy eating habits | ▪ Communication and trust  ▪ Expertise and funding  ▪ Maintaining engagement and enthusiasm (hindered by staff turnover and burnout)  ▪ Logistical hurdles and competing priorities  ▪ Cultural differences in populations  ▪ Difficulty tracking the impact of partnerships and demonstrating their effectiveness |

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| **Possible Negative Impacts** |
| ▪ Produce and practices being ‘marketing as healthy’ (for example by the private sector), with a comparatively weak evidence-base, despite better options being available  ▪ Stigmatisation or exclusion of groups whereby partnerships are not culturally sensitive, or do not address underlying social inequalities  ▪ Partnerships focused on weight loss could trigger disordered eating behaviours in some individuals |

**Example(s) of Good Practice**

1. **Lancashire County Council** is taking bolder steps towards making healthy food the norm for thousands of children in Lancashire. Its ‘Food for Life’ programme is giving children better access to healthy food, an understanding of where food comes from, and is engaging the most deprived schools and early years settings, to embed a positive food culture that will ultimately help children to access and eat a more balanced diet [[32]](#endnote-33).
2. **FoodFutures: North Lancashire's Sustainable Food Partnership** comprises of representatives from the local farming community, local food businesses, the public sector, Lancaster City and County council, Lancaster District Food Poverty Alliance, NGOs, community food groups, and local academic institutions. The partnership works together to cultivate "a thriving local food system that is healthy, resilient and fair" [[33]](#endnote-34).

## 2.6 Food Poverty Projects

**Action:** Explore Whether Food Poverty Projects Alongside the Council Could be Implemented

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Increasing access to nutritious food  ▪ Reducing Malnutrition  ▪ Improving prenatal and early childhood nutrition  ▪ Lowering the risk of chronic disease  ▪ Improving mental and emotional wellbeing  ▪ Promoting healthier eating habits  ▪ Increasing self-efficacy | ▪ Good collaboration between Local Authorities, healthcare providers, and community organisations  ▪ Identification of vulnerable populations, targeted outreach and a holistic approach  ▪ Integrated food poverty projects with other health initiatives  ▪ Proper storage and hygiene standards for food poverty projects (especially those with limited resources) |

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| **Possible Negative Impacts** |
| ▪ Processed foods with high sugar, salt, and unhealthy fats might be more readily available for donation compared to fresh produce or whole grains  ▪ The masking of underlying problems (accessibility and affordability)  ▪ People may experience disempowerment or loss of control over food choices |

**Example(s) of Good Practice**

1. **Blackburn with Darwen Local Authority** since April 2023, has offered significant grants to all its schools to help provide food to their most vulnerable pupils and families. The grants were to support around 8,000 of the most vulnerable pupils who would not normally be eligible for free school meals [[34]](#endnote-35).
2. **Lancashire and Cumbria FareShare** operates a large food distribution centre that collects surplus food from supermarkets, manufacturers, and other businesses, and then distributes it to a network of charities and community groups across the region. These groups then provide the food to people in need through food banks, school breakfast clubs, homeless shelters, and other programs [[35]](#endnote-36).

# 3.0 Digital Transformation

## 3.1 Digital Transformation Plan

**Action:** Develop an ICB ‘Digital Transformation Plan’ that Incorporates the ‘What Good Looks Like’ Framework, and is Shared with Place-Based Partnerships

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Virtual/online consultations (see 3.3 & 3.4)  ▪ Portals allowing patient access to records  ▪ Electronic Health Records (EHRs) centralising platforms of shared data  ▪ Remote patient monitoring  ▪ Clinical Decision Support (CDS) Systems  ▪ Digital Health Information Platforms (DHIP)  ▪ Personalised medicine (data driven)  ▪ Streamlined administrative processes  ▪ Reduction in medical errors  ▪ Improved resource allocation | ▪ Robust cybersecurity measures are crucial to protect sensitive patient data  ▪ Maintaining an appropriate level of face-to-face care, is important for clinical capability, and issues such as trust.  ▪Ensure equitable access to digital technologies |

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| **Possible Negative Impacts** |
| ▪ Not everyone has access to reliable internet  ▪ Digital literacy skills, and reliance on technology can exacerbate inequity of access to services |

**Example(s) of Good Practice**

1. **LSC ICB Digital Inclusion Team** is working with a number of voluntary, community, faith, and social enterprise (VCFSE) organisations to enable their digital sustainability, increase numbers of digital health champions, and increase the number of people in our communities that are digitally enabled in order to reduce health inequalities [[36]](#endnote-37).
2. **E-health** is a field that utilises information and communication technology to support the health status of its users. The emergence of this digital health approach has provided a new way of smoking cessation support for smokers seeking help. Meta-analysis has found that personalised e-health interventions can effectively help smokers quit smoking, and diverse remote intervention methods of e-health can provide more convenient options for further customisation [[37]](#endnote-38).

## 3.2 Digital Literacy

**Action:** Collaborate with our Partners to Improve Digital Literacy Across the Region in Order to Reduce Levels of Digital Exclusion

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| **Positive Impacts on Patient Health** | **Challenges** |
| Improved ability to:  ▪ Navigate medical websites  ▪ Distinguish credible medical information  ▪ Fully utilise online patient portals  ▪ Confidently participate in digital initiatives  ▪ Articulate concerns/symptoms/history  ▪ Ask informed questions about treatment  ▪ Track fitness goals and monitor chronic conditions, promoting proactive self-care  ▪ Evaluate health information to make informed decisions | ▪ Ensuring initiatives are culturally sensitive and cater to the diverse needs of different populations  ▪ Distinguishing between credible sources and unreliable ones  ▪ Online info can create unrealistic expectations about health and appearance, leading to feelings of inadequacy e.g. body dissatisfaction and unhealthy comparisons to others |

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| **Possible Negative Impacts** |
| ▪ Cyberchondria (online instigated false perception of being ill) causing anxiety  ▪ Information overload leading to decision fatigue and difficulty making informed choices  ▪ Self-diagnosis online, and subsequent self-treatment, may delay seeking medical advice, potentially worsening outcomes |

**Example(s) of Good Practice**

1. **Get Online @ Your Library (Lancashire Library Service)** provides free basic computer skills training and internet access for residents. This empowers individuals to navigate online resources and build confidence using digital tools, which can be a steppingstone to exploring health information online.
2. **Healthier Lancashire Digital Toolkit** provides a range of resources aimed at improving digital literacy for health and wellbeing. These include tutorials on using patient portals, downloading trusted health apps, or critically evaluating online health information.

## 3.3 Virtual Outpatient Appointments

**Action:** Support Trusts to Deliver More Virtual Outpatient Appointments: Reach the 25% Target

**And**

## 3.4 Online Consultations

**Action:** Support the PCNs to Significantly Increase the Use of Online Consultations, as Part of Embedding Total Triage

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Increased access to care, especially for those in rural areas, with limited mobility, or with conflicting work schedules  ▪ Higher volumes of people seen can potentially increase diagnosis rates, risk assessments and early interventions  ▪ Improved convenience can be achieved with patients saving time and money by eliminating travel and periods spent in waiting rooms | ▪ Some patients may prefer face-to-face appointments for interaction and trust  ▪ Online consultations may pose communication barriers, in terms of internet connectivity and building rapport.  ▪ Effective communication may be limited by a reduction in non-verbal clues |

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| **Possible Negative Impacts** |
| ▪ Virtual consultations restrict clinical ability to perform thorough physical examinations, which can be critical for diagnosing certain conditions  ▪ Online consultations may not be suitable for many ‘first’ and diagnostic appointments, potentially leading to underdiagnosis [[38]](#endnote-39) |

**Example(s) of Good Practice**

1. **L&SC ICB** were one of the 8 national pilot locations to offer the national Diabetes Prevention digital stream suite of interventions [[39]](#endnote-40). The digital stream offers the usual support, assistance and guidance to people at risk of diabetes, but also uses digital interventions such as:
   1. wearable technologies that monitor levels of exercise
   2. apps which allow users to access health coaches
   3. online peer support groups
   4. the ability to set and monitor goals electronically

This online method of recording activity and monitoring progress has the potential to have the same impact as face-to-face interventions – helping bring down high blood sugar levels and in turn prevent or delay onset of the disease.

1. **Lancashire Teaching Hospitals NHS Foundation Trust** has, since Covid-19, launched Attend Anywhere’ where suitable outpatient appointments are performed as a video consultation. Basically, the usual face to face appointment, is conducted over a PC or mobile device instead of at the hospital or community clinic.

# 4.0 Travel and Transport

## 4.1 Promote Safe and Secure Cycling and Walking

**Action:** Support Trusts and ICB Partners to Improve and Maintain Secure Storage Facilities and Safe Travel Routes for Cyclists / Walkers.

**And**

4.4 Cycle Lanes for Accessing Healthcare Sites

**Action:** Work with Local Authorities to Improve/Create Cycle Lanes In Relation to Accessing Healthcare Sites.

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Increased physical activity by people replacing short car trips with cycling and walking  ▪ Active Travel by staff as well as patients  ▪ Reduced stress in terms of physical activity and exposure to nature being stress-relieving  ▪ Secure storage and safe routes minimising stress  ▪ Social interaction can be fostered along dedicated paths and shared spaces  ▪ Reduced air pollution, which is particularly beneficial for respiratory health in urban areas with high pollution | ▪ Creating truly safe routes that separate cyclists and pedestrians from car traffic  ▪ Strategic route planning that prioritises routes through low-traffic areas  ▪ It is crucial that proper signage, lighting, and infrastructure is funded  ▪ Ensuring walking and cycling infrastructure is accessible for all ages and abilities, e.g. dedicated areas for wheelchairs, benches for rest, and well-maintained surfaces |

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| **Possible Negative Impacts** |
| ▪ Potentially more accidents, for cyclists and walkers especially if infrastructure isn't designed well  ▪ Despite cycling and walking reducing pollution, participants can be exposed to air pollution  ▪ Most e-bikes use lithium-ion batteries, which can overheat and ignite. In London, there was an e-bike or e-scooter battery fire every two days in 2023, and safety procedures need to be promoted as per London Fire Brigde’s ‘ChargeSafe’ campaign [[40]](#endnote-41) |

**Example(s) of Good Practice**

1. **Lancashire County Council** has ‘Local Cycling and Walking Infrastructure Plans (LCWIPs)’. These are a new, strategic approach to identifying cycling and walking improvements, and the plans will enable a long-term approach to developing local cycling and walking networks to realise the vision of safer, greener and healthier travel opportunities [[41]](#endnote-42).
2. **Vivup** is a UK-based employee benefits provider that works with NHS providers. A salary sacrifice scheme allows NHS staff to spread the cost of a new bike and safety equipment over monthly salary repayments, typically at a tax-efficient rate.

## 4.2 Transport Links and Access to Healthcare Sites

**Action:** Work with Local Authorities and Transport Providers to Improve Public Transport Links and Access to Healthcare Sites

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Increased access via public transport or better infrastructure, is especially important for those in rural areas or with limited mobility  ▪ Improved access to care is crucial for increasing  levels of prevention, screening, and chronic disease management; and reducing missed appointments  ▪ Less crowded routes and travel which offers more comfort/convenience reduces stress  ▪ Patient empowerment can be fostered by a sense of more control over access to healthcare  ▪ Improved emergency outcomes can be achieved due to faster treatment responses i.e. ambulance conveyance times [[42]](#endnote-43) | ▪ Accessibility must consider rural areas, underserved communities, and people with disabilities  ▪ Ensuring new hospitals, plus any new community diagnostic centres, are strategically located for the accessibility of disadvantaged groups  ▪ Prioritising prevention, self-care and community-focused approaches, with better use of health and care partners, such that the challenge of improved access faced by the new hospitals programme is affordable |

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| **Possible Negative Impacts** |
| ▪ Improving the transport links of disadvantaged areas, may lead to gentrification, i.e. where the area becomes more desirable, leading to rising rents and property values. This could potentially displace current residents  ▪ Unbalanced funding allocations across different areas can cause further disparities in access to healthcare |

**Example(s) of Good Practice**

1. **Lancashire Teaching Hospital Trust (LTHTr)** supports people to use **The Healthcare Travel Costs Scheme**, which applies to people with low-incomes or people in receipt of benefits. The scheme states “you should use the cheapest, most appropriate means of transport, which in most cases will be public transport”. It only covers patients, not those who are visiting people in hospital. At LTHTr, people can be reimbursed at LTHTr’s General Office, or by submitting a form to the NHS Choices website.
2. **Blackburn with Darwen** **Local Authority** has a deal with the Department of Transport around extra funding in 2023/24 and 2024/25. This has seen the development of a new orbital service with links from sheltered accommodation locations and parts of Darwen, to the wider transport network and the hospital. The previous provision (‘dial-a-ride’) did not permit bus pass use, but the new regular service does, and the necessity to change buses at the bus station to get to the hospital, is no longer necessary.

## 4.3 Non-emergency Patient Transport

**Action:** Create an ICB ‘Travel Plan’, Conjoining Trust, Local Authority, and Other Partner ‘Travel Plans’ with ICB Responsibilities for Non-Emergency Patient Transport Improvement

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Higher Tech Vehicles may contain features which improve patient safety  ▪ More vehicles catering for immobility e.g. more wheelchair-accessible vehicles  ▪ More staff being well trained in disability needs, and being better equipped to relieve potential anxieties  ▪ Better comfort and dignity via clean, well-maintained vehicles with features such as temperature control  ▪ Good transport support, facilitating participation in support groups or condition-related social interactions | ▪ For those with limited mobility or those living in remote areas) door-to-door pick-up/drop-off can be costly  ▪ Upfront cost of Electric Vehicles (EVs) and charging infrastructure  ▪ Seizing Government funding opportunities and forging partnerships with private sector industry  ▪ Decreasing inefficiencies driven by patient disorganisation/forgetfulness  ▪ Extreme weather impacting on the performance of EVs |

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| **Possible Negative Impacts** |
| ▪ New EV coverage not extending to all areas (e.g., rural) may exacerbate inequity of access  ▪ Higher operating costs compared to traditional vehicles, may lead to transport fees for patients (causing further inequity)  ▪ EVs requiring charging stops, may lead to increased journey times for patients |

**Example(s) of Good Practice**

1. **Homerton University Hospital** will become the first NHS Hospital Trust to have all ambulances being fully electric by the end of 2024. Each ambulance, in the new fully electric fleet, is estimated to save 4,000 kilograms of CO2 emissions every year. Lightweight, more accessible features are described as advantageous for the crews, and the vehicles can convey patients with a powered trolley bed system and a powered carry chair, increasing convenience for patients. Also, an integrated scanning system can be used to scan for stock levels of items, potentially improving patient safety via the stock-taking of essential items [[43]](#endnote-44).
2. Serving the **University Hospitals of Leicester**, a new fully electric Hospital Hopper bus service has been on the roads since June 2022. This provides a more sustainable travel option for and runs half-hourly which promotes patient engagement with services.

## 4.4 Cycle Lanes for Accessing Healthcare Sites (see 4.1)

# 5.0 Medicines

## 5.1 Green Inhalers

**Action:** Establish Green Inhaler Guidance and Training Across the Region for Primary and Secondary Care.

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Dry Powder Inhalers (DPIs) often have dose counters, which can help patients take the correct amount of medication  ▪ DPI users cite easier usage compared to traditional inhalers  ▪ Being offered a greener choice, empowers patients and fosters a sense of shared decision-making with clinicians  ▪ Peoples’ understanding of their green choice, can help their sense of self-worth | ▪ Offering different inhalers, may be offering options that deliver medication less effectively for the individual's needs  ▪ Providing information such that traditional inhalers are still viewed as perfectly acceptable  ▪ Greater variation in types of inhalers, will likely add to complexity of discussions |

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| **Possible Negative Impacts** |
| ▪ DPIs rely on inhalation technique to deliver medication. Poor technique may result in low doses and loss of symptom control  ▪ DPIs may be more challenging for some people, e.g., children, leading to extra training needs  ▪ Small increased risk of mouth fungal infection (thrush) with DPIs |

**Example(s) of Good Practice**

1. The **Greener Practice High Quality and Low Carbon Asthma Care Toolkit** is a national toolkit providing guidance and resources for general practices to improve asthma outcomes while reducing their environmental impact. It includes downloadable resources, educational materials, and step-by-step guides for implementing quality improvement projects focusing on asthma diagnosis, medication, and inhaler use [[44]](#endnote-45).
2. **L&SC Medicines Management Group** **(LSCMMG)** has desk-top guidance that complements the Greener Practice toolkit. It includes information specific recommendations for prescribing in Lancashire and South Cumbria and can be accessed through the LSCMMG website [[45]](#endnote-46).

## 5.2 Reduce Waste from N2O

**Action:** Support Trusts to Develop Plans to Optimise and Reduce Waste from N2O

N2O, also known as laughing gas, is used in hospitals for procedural sedation and analgesia (PSA). It is 300 times more potent than carbon dioxide as a greenhouse gas. The NHS estimates that 5% of an acute hospital’s total carbon footprint is attributable to anaesthetic gases, particularly N2O [[46]](#endnote-47). One bottle of another commonly used anaesthetic gas, desflurane, has the same global warming effect as burning 440 kg of coal [[47]](#endnote-48).

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Reduced nausea and vomiting post-surgery or birth from minimising N2O use  ▪ Improved Cognitive Function post-surgery or birth from minimising N2O use, improving decision-making and recovery rate  ▪ Offering other options, may such as IV drugs, patient-controlled pumps, or relaxation and distraction techniques, may better support the patient  ▪ Lower long-term exposure may protect staff from memory loss, vitamin B12 depletion and ringing or buzzing in the ears | ▪ Limited evidence on patient health outcomes based on different types of anaesthetic gases used  ▪ Some greener alternatives e.g., Xenon are less readily available and expensive  ▪ The needs for additional staff training and equipment adjustments  ▪ Potential lack of patient suitability to alternatives  ▪ Lack of commercial availability of greener N2O machines  ▪ Encouraging anaesthetists to consider carbon footprints e.g., avoiding N2O and practising low-flow anaesthesia requires careful review of alternative measures [[48]](#endnote-49) |

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| **Possible Negative Impacts** |
| ▪ Alternatives to traditional options, may be less effective for certain types of pain or sedation, potentially delaying recovery  ▪ Different pain medications may have varying side effects such as drowsiness or dizziness, and some may have a greater effect on respiration, haemodynamics and cognitive function |

**Example(s) of Good Practice**

1. **The Newcastle Upon Tyne Hospitals NHS Foundation Trust** became the first Trust to use a Mobile Destruction Unit (MDU) in September 2021. The MDU purifies 99.6% of the nitrous oxide entering the unit, ‘cracking’ the potent greenhouse gas into nitrogen and oxygen which are harmless [[49]](#endnote-50). N2O with Oxygen (gas and air) works quickly and wears off quickly, can be self-administered (giving a sense of control during childbirth), and is considered safe (for both mother and baby when used in birthing). As such, it may be appropriate for Trusts to consider similar mobile destruction units (MDUs) as used in Newcastle.
2. **East Lancashire Hospitals Trust** ’The Great Escape: The Nitrous Oxide Mitigation Project’has thoroughly reviewed the Trust’s nitrous oxide usage. At the Blackburn site it found an environmental burden >2,500 tonnes of CO₂e per year, contributed to by a major pipe leak in the main theatre complex. Also, one room in the Central Birth Suite was identified as having higher than recommended levels of N2O. These issues were subsequently fixed, via the isolation and closure of the leaking pipeline, and via the unblockage of ventilation flow in the Central Birth Suite [[50]](#endnote-51).

# 6.0 Supply Chain and Procurement

## 6.1 Sustainable Procurement Policy

**Action:** Encourage ICB / Trusts / Partner Members to Have a Sustainable Procurement Policy.

**And**

## 6.2 Sustainable Procurement Strategy

**Action:** Support the Development of an ICB-Wide ISO20400 Sustainable Procurement Strategy That all Trusts Can Use (Possibly Other ICP Partners Too)

**INDIRECT IMPACTS**

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Sourcing goods from cleaner producers may reduce water and air pollution, improving multiple health issues, such as asthma, cardiovascular disease and cancer [[51]](#endnote-52)  ▪ Judicious use of antibiotics should help combat the growing problem of antibiotic resistance, limiting the growth of more difficult-to-treat infections | ▪ Development of guidelines and policies that prioritise sustainable products and responsible waste management  ▪ Upheaval of existing arrangements, including the forging of new partnerships.  ▪ A shift towards a longer-term view is needed, where whole life-cycle impacts need to be considered from acquisition to disposal  ▪ Staff training on sustainable procurement to enable informed choices  ▪ Greenwashing – companies marketing their sustainability disingenuously  ▪ Lack of international standards on sustainability and  emissions reporting |

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| **Possible Negative Impacts** |
| ▪ Some sustainable materials may lack the barrier properties of traditional plastics, which are crucial for protecting sensitive medical products from moisture, oxygen, or contamination. This could potentially compromise the clinical effectiveness of products |

**Example(s) of Good Practice**

Some medical suppliers have created internal codes of conduct and/or come together as industry groups to set overall principles of procurement, such as:

1. **The Pharmaceutical Supply Chain Initiative** is a group of pharmaceutical and healthcare companies who share a vision of excellence in safety, environmental, and social outcomes in the communities where they buy [[52]](#endnote-53).
2. **The Sustainable Healthcare Coalition** is a healthcare sector led group that looks for the greatest opportunities to inspire sustainable practices in healthcare through the collaboration of its members [[53]](#endnote-54).

**DIRECT IMPACTS**

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Sustainable cleaning products show promise for improving indoor air quality  ▪ Biodegradable healthcare products e.g., made from citrate-based polymers, may reduce HCAI risk, due to inherent antimicrobial properties [[54]](#endnote-55)  ▪ Durable well-maintained re-usable equipment can lower the spread of germs compared to improper disposal methods [[55]](#endnote-56)  ▪ Packaging made from natural materials rather than plastics, reduces chemical exposure (BPA and phthalates), linked with harm such as cancer, immunosupression and reproductive defects [[56]](#endnote-57) | ▪ Sustainable alternatives likely to have relatively higher costs  ▪ Transparency with patients during transitions to new materials to ensure trust and understanding  ▪ Collaboration between healthcare providers, manufacturers and policymakers  ▪ Evolving regulatory landscape  ▪ Continued research to guarantee efficacy and safety, and to establish degradation rates, stimuli-responsiveness, biodegradability, and biocompatibility |

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| **Possible Negative Impacts** |
| ▪ Natural cleaning products, might be less effective against harmful bacteria  ▪ Recycled materials may contain residual contaminants that could leach into products and pose health risks. For instance, recycled food contact plastics are vectors for toxins [[57]](#endnote-58)  ▪ Certain natural fibres used in clothing or building materials might trigger allergies in some people |

**Example(s) of Good Practice**

1. **University Hospital of Morecambe Bay Trust (UHMBT)** has (in its Green Plan) committed to develop a Sustainable Procurement Strategy, which will involve (among other things) the provision of sustainable procurement training to all procurement staff [[58]](#endnote-59).
2. **The Lancashire Procurement Policy** **(LPC)** lays out fundamental procurement principles and intended direction for collective contracting between the NHS Trusts of Blackpool Teaching Hospitals, East Lancashire Hospitals, and Lancashire Teaching Hospitals. The policy recognises the importance of working with suppliers to lower the carbon impact of all aspects of procurement; making decisions based on whole life cycle costs and minimisation of waste; and encouraging local suppliers to bid for the supply of goods and services, promoting the use of local businesses whenever possible [[59]](#endnote-60).

# 7.0 Building Energy

The NHS is estimated to emit 25 mega tonnes of CO2 equivalent per year [[60]](#endnote-61), which is roughly equal to around 5% of the country’s emissions, and 40% of public sector emissions [[61]](#endnote-62). The operation of NHS facilities currently makes up 15% of the NHS Carbon Footprint Plus (‘Plus’ meaning inclusive of emissions that can be influenced), of which 10% is building energy (operational carbon) [[62]](#endnote-63).

In terms of air quality in Lancashire, fine particulate matter (PM2.5) concentrations are below the national average (see appendix 1). However, there is huge disparity in distribution of air pollution. For instance, data published by the British Lung Foundation in 2018, revealed that air quality around 4 GP practice locations in Barrow-in-Furness, was above 16 micrograms per m3, all 4 featuring in the worst 10 GP surgeries nationally for PM2.5 concentrations (see appendix 3) [[63]](#endnote-64).

Key health conditions associated with air pollution primarily include asthma, respiratory disease, coronary heart disease, stroke, and lung cancer. Recommended annual exposure limits should be 5 μg/m3 for PM2.5, and 10 μg/m3 for nitrogen dioxide (see appendix 5). Appendix 2 shows that only 4 North-West districts (all Cumbria area) were on average below the recommended limit during 2022.

## 7.1 Community Renewable Energy

**Action:** Work with Partners to Develop Community Renewable Energy initiatives.

Community renewable energy initiatives are projects where local residents, businesses, and organisations such as the NHS, work together to generate clean power from renewable sources. Types of initiatives include community-dedicated (or even community-owned) solar farms, solar panels on the rooftops of homes and businesses, community wind turbines, and biogas digesters.

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Less air pollution (smog, particulate matter, nitrogen oxides) reducing respiratory issues, heart disease, and cancer  ▪ Reduced reliance on the national grid providing users with lower electricity costs  ▪ Increased energy security as communities become less dependent on traditional energy sources and price fluctuations  ▪ Local jobs in installation, maintenance, and education  ▪ Community involvement fosters a sense of ownership and empowerment | ▪ High upfront costs  ▪ Complex funding options  ▪ Long-term maintenance needs  ▪ Upheaval of existing arrangements, including the forging of new partnerships.  ▪ A shift towards a longer-term view is needed, where impacts need to be considered from acquisition to disposal  ▪ Feasibility studies, complex regulations and identifying sites can delay projects  ▪ Addressing community concerns, and ensuring grid integration add to the complexities |

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| **Possible Negative Impacts** |
| ▪ Low-income residents might struggle to afford upfront costs, missing long-term benefits  ▪ Increased demand for those properties with cheap energy could displace low-income renters  ▪ Unequal power dynamics can exclude low-income residents from decision-making, perhaps prioritising wealthier voices  ▪ Land use could reduce otherwise planned affordable housing |

**Example(s) of Good Practice**

1. **University Hospitals of North Midlands** has installed 1089 solar panels on hospital roofs funded by ethical investors. The community energy company maintaining the panels receive revenue from surplus energy sold back to the grid; the hospital receives cheap renewable energy (and improved energy resilience); investors get a return (over 20 years); and surplus monies accumulate into a ‘community fund’ to support local people [[64]](#endnote-65).
2. **Repowering London** is a non-profit energy cooperative which works in partnership with local authorities and community groups in some of London’s poorest areas. The organisation aims to cut carbon dioxide emissions, fight fuel poverty, and generate training and employment opportunities for communities. Its model enables local communities to invest in ethical solar projects, often on social housing where individual households might not otherwise be able to afford the capital outlay. Profit from the sale of electricity to the grid is used to benefit the whole community and to give investors an annual return. Its projects are run democratically using Community Benefit Societies – a type of co-operative – to ensure that every voice is heard [[65]](#endnote-66).

## 7.2 Green Gas

**Action:** Explore the Procurement of Green Gas Across the ICB

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Switching to green gas sources like biogas eliminates emissions (e.g., nitrogen oxides and particulate matter), with less polluted air reducing pollution-related mortality/morbidity  ▪ Based on the existing evidence and the known negative impact of fossil fuel emissions on air quality, there is a suggestion that buildings using green energy may have better indoor air quality, but further research is needed to definitively establish this connection, which is complicated by the fact that greener buildings tend to have better ventilation systems | ▪ Existing healthcare sites might require upgrades to their infrastructure to accommodate green gas sources  ▪ To ensure optimal efficiency and prevent energy waste, existing energy systems may require costly adjustments, which will likely involve disruption to care facilities  ▪ Green gas sources might be less readily available and more costly  ▪ Staff might require additional training to operate and maintain equipment related to using green gas sources |

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| **Possible Negative Impacts** |
| ▪ Biogas alternatives still release pollutants during combustion and these pollutants, and their effects are perhaps less well researched and understood  ▪ Improperly managed facilities in particular, might release harmful emissions during production, although well-regulated plants minimise risks  ▪ Hospitals transitioning to green gas, might require infrastructure upgrades, whereby construction dust could temporarily impact indoor air quality, and there could be disruptions to care during the upgrade process |

**Example(s) of Good Practice**

1. **Blackburn with Darwen Council** have approved proposals for an anaerobic digestion facility (ADF) in Darwen Lancashire. The ADF would treat waste onsite to generate renewable energy, predominantly biomethane 'green gas', but also electricity and biofertiliser. The gas (enough to power 7,000 homes daily) would be exported to the local distribution network, and the electricity generated would be used to power the plant. International research is ongoing regarding on-site ADFs for hospitals, particularly regarding optimising waste streams, managing potential risks associated with medical waste, and ensuring cost-effectiveness. Pilot projects have demonstrated potential, and East Suffolk and North Essex NHS FT already processes its food waste into a compost-like residue which an off-site ADF turns into green energy [[66]](#endnote-67).
2. **University College London Hospital NHS Foundation Trust (UCLH)** has implemented a combined heat and power (CHP) system that uses natural gas to generate electricity more efficiently than traditional methods. The waste heat from this process is then captured and used to provide hot water for the hospital. While natural gas is not a perfectly green solution, CHP systems are significantly more efficient than traditional methods and can be a stepping stone towards even greener solutions such as biogas [[67]](#endnote-68).

# 8.0 Capital Projects

## 8.1 Procurement Compliance

**Action:** Work with our Procurement Team to Ensure PPN06/20 (Minimum 10% Weighing for Social Value In Procurement) and PPN06/21 (Carbon Reduction Plan in Place for Contracts Above £5 Million) are Compliant

The NHS Procurement Policy Notice (PPN) 06/21 focuses on integrating environmental considerations into NHS contracts. A minimum of 10% weighting for social value, means that when the NHS evaluates bids from different suppliers for goods, services, or works, at least 10% of the total score will be based on the social value each bid offers. Suppliers will need to demonstrate the positive social impact their bid can generate alongside price and quality considerations. This might involve outlining specific initiatives or programs they plan to implement. This ensures that the NHS procurement process contributes to positive social outcomes within the communities it serves, potentially promoting a more sustainable and equitable healthcare system.

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Tenders encouraged to prioritise healthy lifestyles and preventative healthcare  ▪ Suppliers encouraged to focus on underserved communities facing greater health challenges, e.g., mobile clinics  ▪ Bidders encouraged to offer fair wages, training opportunities, and well-being programs for local employees  ▪ Suppliers to partner local businesses and hire from disadvantaged groups. The economic impact affecting overall health and well-being in the community | ▪ "Social Value" is difficult to define and quantify and metrics might not perfectly capture true public health benefits  ▪ Short-term easy to measure gains, may be prioritised over long-term public health benefits such as reduced inequalities  ▪ Delivery on social value promises might be hampered by resource limitations (both NHS and the supplier).  ▪ Smaller suppliers might lack resources (data and expertise) to demonstrate impact |

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| **Possible Negative Impacts** |
| ▪ Focusing on social value can decrease clinical and cost effectiveness, e.g., choosing high social value suppliers with less clinical expertise and/or higher prices  ▪ Implementing social value scoring effectively can add complexity and time to the procurement process, meaning people waiting longer for service implementation |

**Example(s) of Good Practice**

1. **Lancashire County Council** has stated in its ‘Social value policy and framework 2024-28’ that to realise added-value benefits, “we and our suppliers will collaborate to plan how contracts and projects can be delivered in ways that generate outcomes that contribute to the eight 2050 Lancashire priorities”. These are economic prosperity, transport and infrastructure, environment and climate, housing, early years and education and employment and skills. The policy sets out how the council will deliver social value for Lancashire [[68]](#endnote-69).
2. **Lancashire Teaching Hospitals NHS Foundation Trust** holds the Social Value Quality Mark, and in its commitment to social value, it states “Lancashire Teaching Hospitals will carry out value-based actions and activities to help tackle health and socio-economic inequalities, making lives fairer with improved quality and inclusivity for our communities, businesses, patients, and workforce” [[69]](#endnote-70).

# 9.0 Climate Adaptation

## 9.1 Climate Change Adaptation Plan

**Action:** Develop an ICB-wide Climate Change Adaptation Plan

A climate adaptation plan aims to reduce risks to human health, the environment, and our way of life, through the impact of climate change. **Heatwave preparedness** is particularly important. During summer 2022, there were an estimated 3,000 all-cause excess deaths associated with 5 heat episodes, the highest number in any given year [[70]](#endnote-71). Heat-related mortality is associated with deprivation and poor housing. Since 1971, despite rises in mean summer temperatures of at least 1°C, the more prosperous southeast of England, has not seen a rise in heat-related excess mortality. In the USA, in states such as North Carolina, heat-related mortality has virtually disappeared, with the likely explanation being a large increase in air-conditioning presence in homes [[71]](#endnote-72). Parts of the UK population are vulnerable to heat, due to a lack of knowledge regarding the dangers, poor heat insulation of buildings and homes, and poor pre-existing health. Heat-related excess deaths, tend to be represented by increases in typical death reasons, such as cardiovascular disease, respiratory disease and neurological conditions (see appendix 6). **Flooding** presents different impacts and challenges as outlined below.

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Public Education (through campaigns and targeted outreach) on staying cool, hydration, and heatstroke symptoms will improve community knowledge and action  ▪ Support insulation through grant signposting and education and awareness  ▪ Heat alert systems will warn people on heatwaves, improving preparedness  ▪ Reducing urban heat, by planting trees, improving building temperature control (e.g., care homes), and providing cooling centres in public buildings, may prevent heat-related mortality and morbidity  ▪ Upgrading flood defences can ensure continued healthcare during floods, and protect essential equipment and supplies  ▪ Stockpiling supplies in readiness for floods and raising flood awareness among healthcare staff and the public, can reduce flood-related injuries and fatalities  ▪ Collaboration of healthcare, community organisations and social care will improve staff training, protocols and preparedness  ▪ Risk Assessments and plans can prioritise critical/essential services, and emergency protocols can prioritise the most vulnerable | ▪ Financial strain of funding adaptation  ▪ Predicting adaptation requirements and their health impacts requires robust data on local climate projections, vulnerable populations and potential health risks  ▪ Successful planning relies on close collaboration between the NHS, local authorities, and other agencies. Overcoming bureaucratic hurdles can be challenging  ▪ Maintaining public, staff, political and financial support for plans over time, may prove to be difficult  ▪ New challenges such as potentially rising vector-borne diseases and tick-borne diseases, may require close collaboration with public health  ▪ More extreme weather events may require planning for disruption to transport systems and power supplies, to enable continued access to healthcare  ▪ Further research of the phenomenon of climate change anxiety (CCA) [[72]](#endnote-73) |

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| **Possible Negative Impacts** |
| ▪ Care can be compromised if climate adaptation is not carefully balanced with immediate health care needs  ▪ Mental Health impacts of climate change such as anxiety can be exacerbated by alarming awareness campaigns. Access to common mental health services such as psychological therapies (IAPT) can mitigate against this, as can environmental actions and knowledge of such actions  ▪ Displacement due to flooding could cause post-traumatic stress disorder (PTSD), where evacuation plans are insufficient. Again, this could be mitigated against by access to mental health services |

**Example(s) of Good Practice**

1. **Blackpool Teaching Hospitals NHS Foundation Trust** has a severe weather plan co-owned by the Trust, Blackpool Council and the ICB. The plan is directly linked to the Heatwave and Cold Weather Plans for England and details specific actions for various alert levels according to national guidance, the Local Resilience Forum and organisation risk registers. Climate change adaptation is covered in the Trust’s risk registers, and a multidisciplinary team has been established to develop a coordinated and integrated adaptation plan [[73]](#endnote-74).
2. **East Lancashire Hospitals Trust** states in its Green Plan, that it engages with public authorities and partners in tackling extreme weather events, such as heat waves and flooding. It worked with Blackburn with Darwen Borough Council on the ‘Connecting East Lancashire’ programme, where climate change adaptation was a prominent theme. Building on its existing ‘Heat Wave and Extreme Weather’ plans, the Trust is analysing climate change risks and developing action plans across its estate and service areas [[74]](#endnote-75).

## 9.2 Climate Ready Upgrades to Estates

**Action:** Ensure Trust Estates Strategies Incorporate Climate Change Readiness and are Actively Assessing the Built Environment to Make Climate-Ready Upgrades

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Upgrading insulation, installing cool roofs and walls, and optimising ventilation systems will improve patient comfort  ▪ Natural ventilation and shading with strategically placed trees, landscaping and green spaces around facilities, will reduce the heat island effect, improve air quality, and boost mental well-being  ▪ Better temperature regulation, managed digitally by individual patients, will improve comfort and provide a sense of empowerment  ▪ Installing waterproof barriers and drainage will ensure continued access to services and minimise disruptions to care | ▪ Financial strain of retrofitting costs  ▪ Technical hurdles to adapting older (sometimes historic) buildings  ▪ Integrating new technologies that might require staff training  ▪ Securing long-term political and financial commitment for aspects such as ongoing maintenance and updates may be difficult |

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| **Possible Negative Impacts** |
| ▪ Construction can cause disruption and generate dust, which can affect patients e.g., those with respiratory issues  ▪ Construction noise can be stressful for patients and staff, potentially impacting recovery and work efficiency  ▪ Building processes might involve chemicals that could irritate patients or staff  ▪ During renovations, certain areas might be inaccessible impacting on patient care |

**Example(s) of Good Practice**

1. **Lancashire and South Cumbria New Hospitals Programme** is aiming to address significant problems with our ageing hospitals in Preston, Lancaster, and Barrow-in-Furness. The New Hospitals Programme offers a once-in-a-generation transformation opportunity to provide cutting-edge hospital facilities. The poor condition of current estates means they lack sufficient environmental controls and are expensive to run, with probable negative Impacts on health [[75]](#endnote-76).
2. **Lancashire and South Cumbria ICB** have ensured that all new builds and retrofits over £15 million, meet the NHS England Net Zero Building Standard (published 23/02/23) [[76]](#endnote-77).

# 10.0 Green Space and Biodiversity

## 10.1 Biodiversity and Greenspace Initiatives

**Action:** Working with Partners Such as NHS Forest and Lancashire Wildlife Trust to Develop Further Biodiversity and Greenspace Initiatives Across the ICB

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Reduced stress hormones, lower blood pressure, and improved mood, are known associations with access to green spaces  ▪ Sense of community and belonging fostered by relaxation and social interaction around green spaces  ▪ Increased physical activity where parks, trails, allotments etc- encourage walking, cycling, gardening  ▪ Improved air quality where trees and plants act as natural filters, absorbing pollutants and releasing oxygen  ▪ More active travel due to green spaces will reduce traffic pollution and promote physical activity related health gains  ▪ Reduced heat-related illnesses from trees and green spaces providing shade and regulating urban temperatures  ▪ Enhanced cognitive function is associated with time spent in green spaces, (beneficial for all ages, including developing children)  ▪ High biodiversity can reduce pathogen transmission, where additional habitats for species reduce potential contact between wildlife, livestock, and humans. . | ▪ Green spaces are often concentrated in wealthier areas, leaving low-income communities without such health benefits  ▪ Funding for development and maintenance can be difficult to prioritise against acute medical needs  ▪ Public awareness about the link between green space, biodiversity, and health might be low, and healthcare professionals might not be familiar with "nature prescribing" and the potential benefits  ▪ Biodiversity efforts may require assessment of whether risk reduction strategies are needed [[77]](#endnote-78), host and vector management being important considerations. |

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| **Possible Negative Impacts** |
| ▪ Climate change and vandalism can threaten the sustainability and health benefits of green spaces  ▪ Concerns that green space use, and promotion of such, is being hampered by perceptions of poor safety, particularly in disadvantaged areas |

**Example(s) of Good Practice**

1. **South Ribble Borough Council** has adopted a Biodiversity Strategy, pledging to restore, conserve and enhance the biodiversity in the Borough. Its strategic vision is for a Borough where biodiversity is bigger, better and more joined up. With networks of accessible, natural greenspace, linking areas of habitat that are positively managed for wildlife, biodiversity gains, as well as resident enjoyment and wellbeing [[78]](#endnote-79).
2. **Royal Cornwall Hospital Trust** has appointed biodiversity champions who ensure that all of its building projects deliver a “Biodiversity Net Gain” of at least 10%, which is required by law (from January 2024). Cornwall Council also make this a requirement of all planning applications. Examples include planting trees and creating new habitats gardens and wild areas to deliver biodiversity net gain [[79]](#endnote-80).

# 11.0 Waste

## 11.1 PPE and PPE Waste

**Action:** Reduce the use of PPE, While Exploring Whether Reusable Alternatives to Single-Use PPE Items (Aprons, Wipes, Face Masks) are Clinically More Appropriate Across the ICB.

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| **Positive Impacts on Patient Health** | **Challenges** |
| ▪ Reduced risk of skin irritation may occur where overuse of PPE, for example gloves, would otherwise have led to skin irritation and dermatitis for healthcare workers  ▪ Better Patient Experience can be achieved when excessive PPE creates communication barriers and makes it more difficult for patients to connect with clinicians  ▪ Reduced Risk of Hospital-Acquired Infections (HAIs) occurs when overuse of PPE creates a false sense of security and potentially leads to lapses in other infection control practices like hand hygiene  ▪ Re-usable alternatives (aprons, wipes, face masks) may be clinically more appropriate to single-use PPE items. For instance, comparative study supports the view that reusable medical gowns offer superior protection and performance over disposable alternatives [[80]](#endnote-81) | ▪ Healthcare workers might be hesitant to reduce PPE use (during outbreaks or with highly infectious patients or immune-compromised patients), due to fear of contracting infections or transmitting them to patients  ▪ Reducing reliance on single-use PPE might require investing in reusable options or alternative materials and establishing PPE reprocessing Infrastructure  ▪ Changing practice may require standardising protocols, staff training and education, and behavioural and cultural shifts |

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| **Possible Negative Impacts** |
| ▪ Overly aggressive reductions could increase the risk of exposure. Research has found that C difficile infected gowns treated with 1,000 parts per million of chlorine for ten minutes (the time recommended by the DHSC) still contained all strains of C difficile spores, which did not reduce [[81]](#endnote-82)  ▪ Patients might misinterpret reduced PPE as a sign of less stringent procedures being followed, potentially causing anxiety |

**Example(s) of Good Practice**

1. **North Tees and Hartlepool NHS Foundation Trust** launched its Reusable Gown Service in 2020. They offer a fully managed sterilisation and laundry service for reusable gowns. Modelling of savings (based on using 7000 gowns every week) estimates annual savings at 223 tonnes of CO2e, 51 tonnes of clinical waste and £382K [[82]](#endnote-83). Furthermore, in semi-structured face to face interviews sites that had used both types of gowns, agreed that reusable gowns offered better protection, and were more durable and comfortable than single-use gowns.
2. **LSC Integrated Care Board** in its 10-Point Green Plan for Practice, emphasises the 3 R’s (Reduce, Reuse and Recycle). Specifically, it advocates use of sustainable/reusable Revolution-ZERO IIR masks, which have been successfully trialled and adopted across the country 15.

# Conclusions

**Sustainable Models of Care**

The ultimate way to improve healthcare sustainability, is through prevention. Targeted health promotion fosters better engagement with key groups, tackles health disparities, and promotes preventive healthcare, leading to a healthier and more resilient population. Community Diagnostic Centres (CDCs) clearly play an important role in this, bringing services closer. As the real value in CDCs is in doing things differently, such as offering preventative services, CDCs need to be well staffed (not diluting staff from elsewhere), be carefully planned, and provide extra capacity. The urge to scale back CDCs in favour of traditional diagnostic provision due to financial pressures, needs to be resisted.

Increased access to healthcare should not by synonymous with increased medicalisation of health-related problems. Building trust, breaking down barriers, and empowering communities to take charge of their health are key to achieving equitable healthcare for all.

Besides a shift towards promoting prevention and self-care, care pathways, specialties and care materials, all need to become more carbon friendly. New technology and innovation will inevitably play an important role. Careful planning, following evidence-based research and collaboration (between patients and clinicians), will foster trust in order to maximise potential new benefits.

**Food and Nutrition**

Understanding food poverty, food insecurity, food bank usage, and employing appropriate strategies which are tailored to specific areas/groups is essential to promote consumption of more sustainable and healthier foods, such as plant-based foods. Clinicians and the public should be well informed about the concept of incorporating more plant-based foods such as fruits and vegetables in everyday food consumption. Generally, plant-based diets incorporating fruit and vegetables, fit well with dietary guidelines for people with long term conditions such as diabetes, being lower in saturated fat, higher in fibre, and other protective substances.

Ideally, a registered dietitian should be part of the health care team that designs a plant-based diet for patients with chronic disease, and physicians should apply MHRA guidelines around monitoring (e.g., monitoring vitamin B12 levels) with certain diets and at-risk patients.

Leveraging strengths of partners and focusing on common sensible goals are crucial for establishing and sustaining effective healthy eating partnerships, and delivering food poverty projects that can truly make a positive impact on peoples’ health.

Again, technology has an important role to play, for instance leveraging the potential of digital menus in hospitals can empower individuals to make more informed choices and can promote healthy behaviours that could be maintained beyond the healthcare setting.

**Digital Transformation**

A well-executed digital transformation plan for healthcare can be a powerful tool for improving patient health outcomes, promoting self-care, preventative care and empowering patients to take an active role in managing their health.

Virtual appointments and online consultations improve access and convenience; however, the limitations need to be considered:

* Potential inequity of access, driven by income, location, education/skills/confidence, age, disabilities (the ‘digital divide’)
* Face-to-face appointment often being preferred by some patients, and in-person interaction helping build trust and rapport

Mistakes via remote consultation are rare, but there is a risk of patients being under-diagnosed, and clearly online consultations are best suited to follow-ups and non-urgent health concerns as opposed to ‘first’ and diagnostic appointments. New technologies to monitor patients real-time, e.g., wearable sensors, may have better potential for recording activity and tracking progress than face-to-face monitoring.

Video-consultations are preferable to telephone appointments, but there are challenges in terms of improving peoples’ digital literacy to facilitate the embracing of new methods. The on-line world can be a scary (leading to cyberchondria) and overwhelming (leading to decision fatigue). Vast amounts of information available can lead to delays seeking treatment (due to self-diagnosing) and can create unrealistic expectations (e.g., about body/appearance).

**Travel and Transport**

Improving public transport links and access to healthcare sites, can (while taking cars off the road) create a system that promotes more engagement with preventative care, more timely treatment, and increased well-being for everyone, especially those currently seeing inequity of access. Healthcare facilities needs to be accessible for everyone, with rural and underserved communities being prioritised, and public transport being affordable.

Supporting travel routes for cyclists and walkers, is in many ways an even better use of resources. It simultaneously improves access while promoting healthier lifestyles and a healthier environment. However, safety concerns must be addressed to ensure that people’s health is not damaged through engaging in what should be a healthy activity. Creating truly safe routes that separate cyclists and pedestrians from car traffic, with proper infrastructure design are crucial. Routes should be accessible for people of all ages and abilities, and this might involve dedicated areas for wheelchairs, benches for rest, and well-maintained surfaces.

**Medicines**

The two actions deemed as requiring health impact analysis, were around ‘establishing green inhaler guidance and training’ and ‘supporting trusts to reduce N2O’. However, patient medication use reviews can also be a powerful tool for the NHS to achieve its net-zero goals (tackling medication waste and optimising prescriptions). The latter is known to have health benefits, e.g., polypharmacy reduction, especially for older adults, can reduce fall risk via removing interactions and side effects from taking multiple medications. Also, providing patients with greener medication options, may improve their self-esteem in terms of knowing they have made a responsible choice.

In respect of green inhalers (dry powder inhalers - DPIs) which don't use greenhouse gas propellants, these are known to lead to improved medication adherence. However, the best inhaler type depends on the individual patient's needs and preferences. Factors such as age, medical history, and the ability to use different inhaler techniques, must be considered.

In respect of reducing N2O, less use can benefit patients by reducing side effects such as nausea and improving cognitive function. However, N2O is well established as safe and effective. N2O with Oxygen (gas and air) works quickly, wears off quickly, and can be self-administered (giving a sense of control) e.g., during childbirth. As such, it may be appropriate for Trusts to consider mobile destruction units (MDUs). If anaesthetists are to be encouraged to consider their own individual carbon footprints, there needs to be national guidance, standardisation, and training, such that anaesthetists are competent and confident with new methods.

**Procurement and Supply Chains**

Integrating sustainable procurement into healthcare provision can contribute to a healthier environment for patients, staff, and the community at large. However, it can be a complex issue, and the key is to be a mindful of health considerations as well as environmental factors when making choices. This can be achieved by checking for certifications; researching materials used in sustainable produce (and their associated health concerns); choosing products with good disclosure about materials used in the processing (and any potential health risks); and prioritising reputable vendors. In terms of contract awards, a minimum 10% weighing for social value in procurement, is mandated. However, there needs to be a balance between any social value added, compared to any loss in clinical output/outcomes, and effective smaller providers should not be disadvantaged by being less able to prove added social value.

**Energy and Waste**

Despite the challenges, community renewable energy initiatives, can pave the way for more sustainable energy, leading to improved health impacts through benefits such as new local jobs and community funds. Collaboration, public education, innovative financing, and learning from established projects can all help initiatives be successful. Switching to green gas sources like biogas eliminates harmful emissions, with less polluted air reducing pollution-related mortality/morbidity.

In terms of PPE and PPE waste, striking the right balance between reducing PPE and ensuring adequate protection for healthcare workers and patients is crucial. Overly aggressive reductions could increase the risk of exposure to infectious diseases, and could also undermine patient confidence, leading to anxiety. Studies have supported the view, that reusable medical gowns offer superior protection and performance over disposable alternatives, whilst offering large CO2e savings and cost savings.

**Green Space and Biodiversity**

Green spaces can improve air quality, increase physical activity, reduce stress hormones, and create a sense of community and belonging. They can also reduce the risk of heat related illnesses where tress and shade regulate urban temperatures.

Healthcare professionals need to be familiar with "nature prescribing" and the potential health benefits, and it is important that new green space initiatives prioritise low-income communities who can realise the highest health gains. It is also important that the use of green spaces are not threatened by concerns around anti-social behaviour and public safety.

Increasing biodiversity can provide a lower risk of zoonotic and vector-borne diseases, where an ecosystem provides additional habitats for species, and reduces the potential contact between wildlife, livestock and humans. Additionally, host and vector management is a viable option. While research has shown that high biodiversity frequently reduces rates of pathogen transmission, potential biodiversity increases do require assessments of how to minimise risk.

**Climate Adaptation**

The main focus of climate change adaptation needs to be around heatwave preparedness. Heat-related mortality is associated with deprivation and poor housing, and much of the UK population is vulnerable to heat, due to a lack of knowledge regarding the dangers, poor heat insulation of buildings and homes, and poor pre-existing health.

Public education and infrastructure will help people stay cool and hydrated, which will lower the risk of heatstroke, heat exhaustion, and other heat-related illnesses. Mitigating heat stress by good planning, can prevent a surge in heat-related emergencies and fatalities, which would place a strain on the health system. Children, older adults, and those with chronic health conditions are more susceptible to heat, and plans must ensure that they have access to support and resources.

Upgrading Trust buildings to face climate change, presents several hurdles, such as the financial strain of upfront retrofitting costs and technical hurdles. However, better regulation of temperature at heath care sites, can result in faster recovery times for patients due to a more comfortable and controlled environment. Also, the improved working conditions can reduce stress and fatigue among staff, leading to better quality care for patients.

Clearly adaptation measures relating to flooding, must ensure continued access to essential healthcare services, when extreme rainfall leads to the flooding of healthcare premises, or the disruption of transport systems or power supplies. It must also consider evacuation procedures for populations affected. Successful planning relies on collaboration between the NHS, local authorities, and other agencies such as public health teams (regarding infectious diseases).

There is a clear role for NHS Mental Health teams to play, as ‘Climate Change Anxiety’ (CCA) becomes more prominent, and as more and more people are affected by extreme weather events, potentially causing trauma.

# Recommendations

1. Harness the power of healthcare prevention through targeted health promotion and community empowerment. This can be achieved by better use of technology and better utilisation of community diagnostic centres.
2. Prioritise equity of access during the promotion of:
   1. carbon-friendly (and healthier) net-zero diets
   2. digital tools
   3. greener transport options
3. While clinically advised polypharmacy reductions are known to benefit patients, the risks/benefits of greener equipment, devices, medicines, inhalers, analgesia and even packaging, may be more complex. It is important that national guidance and advice is adhered to, and that evidence-based certifications are checked. Novel approaches which minimise impacts on patients should be prioritised.
4. Public education, infrastructure and building insulation, are essential measures in adapting to rising temperatures. Vulnerable populations such as those living in care homes, must be prioritised when promoting climate adaptation.

# Appendix 1 – LSC ICB 10-Point Plan for Practices

**1. Declare a practice climate and nature crisis**

**2. Optimise inhalers**

**3. Calculate the practice's carbon footprint**

**4. Monitor and reduce your practice's energy usage**

**5. Consider switching your business banking provider to a green bank**

**6. Environmental prescribing and treatment**

**7. Engage, educate and empower patients to take individual action on the climate crisis for the benefit of their health**

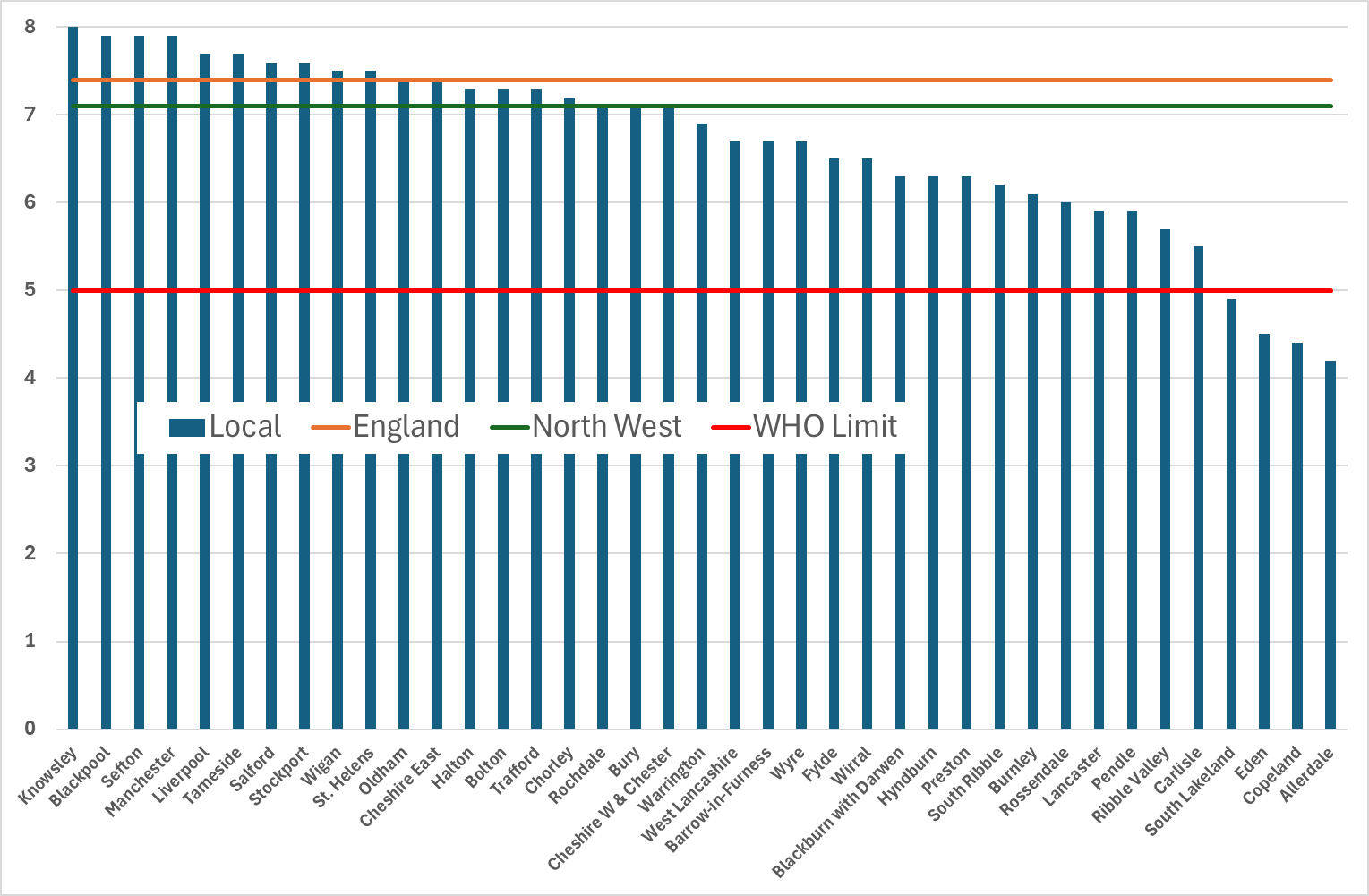
**8. Promote active transport for both staff and patients**

**9. Embed the '3 Rs' into practice culture - Reduce, Reuse, Recycle**

**10. Use the green impact for health toolkit**

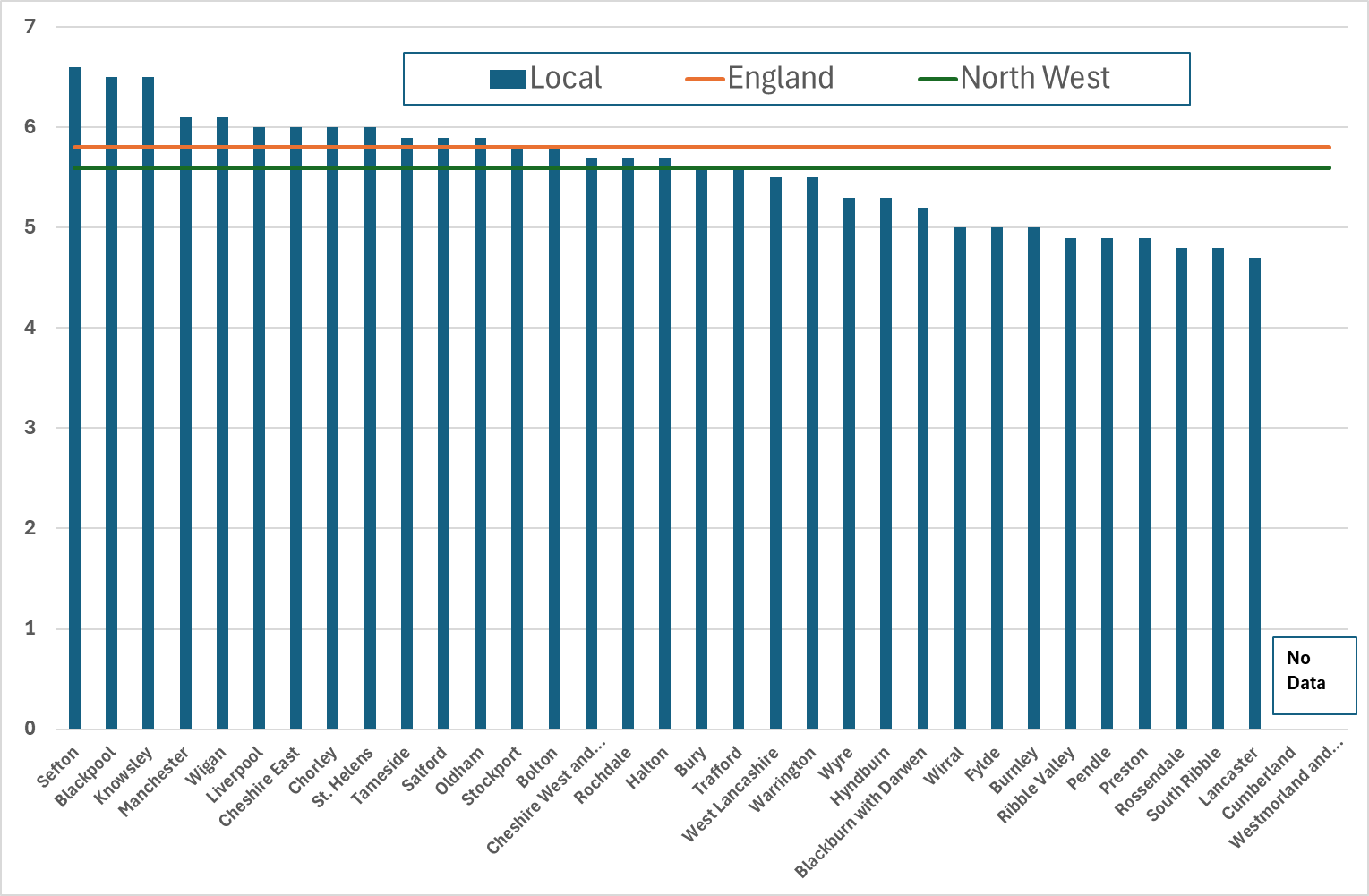
[**https://www.lancashireandsouthcumbria.icb.nhs.uk/GreenerNHS/primary-care/net-zero-resources/10-point-green-plan-practices#:~:text=This%2010%2Dpoint%20plan%20has,the%20NHS'%20net%20zero%20ambitions**](https://www.lancashireandsouthcumbria.icb.nhs.uk/GreenerNHS/primary-care/net-zero-resources/10-point-green-plan-practices#:~:text=This%2010%2Dpoint%20plan%20has,the%20NHS'%20net%20zero%20ambitions)

# Appendix 2 - Background Annual Average PM2.5 Concentrations, North-West, 2021/22 to 2022/23

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**Source:** [**https://fingertips.phe.org.uk/search/air#page/3/gid/1938133043/pat/6/par/E12000002/ati/501/are/E08000001/iid/93867/age/-1/sex/-1/cat/-1/ctp/-1/yrr/1/cid/4/tbm/1/page-options/car-do-0**](https://fingertips.phe.org.uk/search/air#page/3/gid/1938133043/pat/6/par/E12000002/ati/501/are/E08000001/iid/93867/age/-1/sex/-1/cat/-1/ctp/-1/yrr/1/cid/4/tbm/1/page-options/car-do-0)

# Appendix 3 - Fraction of mortality attributable to particulate air pollution (new method), 2023

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**Source:** [**https://fingertips.phe.org.uk/search/air#page/3/gid/1000043/pat/6/par/E12000002/ati/501/are/E08000001/iid/93861/age/230/sex/4/cat/-1/ctp/-1/yrr/1/cid/4/tbm/1/page-options/car-do-0**](https://fingertips.phe.org.uk/search/air#page/3/gid/1000043/pat/6/par/E12000002/ati/501/are/E08000001/iid/93861/age/230/sex/4/cat/-1/ctp/-1/yrr/1/cid/4/tbm/1/page-options/car-do-0)

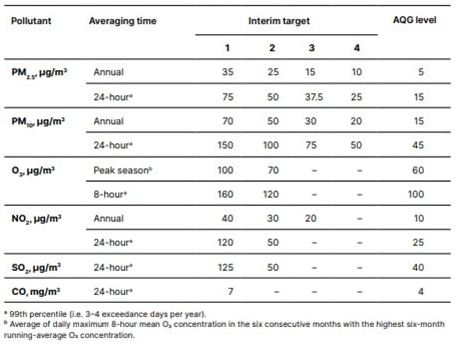
# Appendix 4 - Ten GP Surgeries with worst levels of PM2.5 air pollution in England

**A table with names and a black text

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Available at: <https://cdn.shopify.com/s/files/1/0221/4446/files/PM_Report_FINAL_web_40b0715b-8775-4ee1-a092-2199f9c48a46.pdf?14854756238904833688&_ga=2.227804504.47432139.1543321398-1627606212.1540458037>

# Appendix 5 – World Health Organisation Recommended Air Quality Levels and Interim Targets



Available at: <https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health>

# Appendix 6 - Number of deaths that occurred before, during and after heat-periods for the leading causes of excess death, June to August 2022 heat-periods, England and Wales

A graph of health problems

Description automatically generated with medium confidence

# References

1. Torjesen I. 2018. Statins are overprescribed for primary prevention, study suggests. BMJ. Available from: <https://doi.org/10.1136/bmj.k5110> [↑](#endnote-ref-2)
2. NHS England. North West Coast Clinical Networks. Cardiac. Available from:

   <https://www.england.nhs.uk/north-west/north-west-coast-strategic-clinical-networks/our-networks/cardiac/#:~:text=The%20National%20CPIP%20team%20works,whole%20pathway%20improvement%20and%20transformation> [↑](#endnote-ref-3)
3. NHS. RightCare. RightCare Pathways COPD. 2017. Available from:

   <https://www.england.nhs.uk/rightcare/wp-content/uploads/sites/40/2017/12/nhs-rightcare-copd-pathway-v18.pdf> [↑](#endnote-ref-4)
4. NHS England. Getting It Right First Time. Available from:

   <https://gettingitrightfirsttime.co.uk/what-we-do/> [↑](#endnote-ref-5)
5. NHS England. Getting It Right First Time. Three new interactive pathways support NHS teams at the ‘front door’ to care for patients with diabetes. Available from:

   <https://gettingitrightfirsttime.co.uk/three-new-interactive-pathways-support-nhs-teams-at-the-front-door-to-care-for-patients-with-diabetes/> [↑](#endnote-ref-6)
6. The Royal College of Radiologists. 2022. Clinical Radiology Workforce Census. The Royal College of Radiologists. Available from:

   [https://www.rcr.ac.uk/clinical-radiology/rcr- clinical-radiology-workforce-census-2022](https://www.rcr.ac.uk/clinical-radiology/rcr-%20clinical-radiology-workforce-census-2022) [↑](#endnote-ref-7)
7. The King’s Fund. Two years on, how are community diagnostic centres doing? 2023. Available from: <https://www.kingsfund.org.uk/insight-and-analysis/blogs/how-are-community-diagnostic-centres-doing> [↑](#endnote-ref-8)
8. Healthwatch Blackpool. 2017. GP-Led Walk-In Centre Whitegate Drive Health Centre. Patient Engagement Days. Available from:

   <https://healthwatchblackpool.co.uk/wp-content/uploads/2017/08/2018_REPORT_WhitegateDrive-.pdf> [↑](#endnote-ref-9)
9. Blackpool Teaching Hospitals NHS Foundation Trust. 2022. New Fleetwood community diagnostic centre to offer life-saving diagnostic checks. Available from:

   <https://www.bfwh.nhs.uk/new-fleetwood-community-diagnostic-centre-to-offer-life-saving-diagnostic-checks/> [↑](#endnote-ref-10)
10. Lancashire and South Cumbria ICB. ‘Enhanced Health Checks’ – our approach to proactive case finding in disadvantaged communities. Available from:

    <https://www.lancashireandsouthcumbria.icb.nhs.uk/our-work/prevention-and-health-inequalities/enhanced-health-checks-our-approach-proactive-case-finding-disadvantaged-communities> [↑](#endnote-ref-11)
11. Lancashire and South Cumbria ICB. 2022. Free health assessment bus in Fylde Coast throughout August. Available from:

    <https://www.lancashireandsouthcumbria.icb.nhs.uk/news-and-media/latest-news/free-health-assessment-bus-fylde-coast-throughout-august#:~:text=The%20health%20assessment%20bus%20was,GP%20practice%20during%20the%20pandemic>. [↑](#endnote-ref-12)
12. National Audit Office (NAO). 2021. The use of mobile units in the NHS. Available from:

    <https://www.nao.org.uk/topics/health-and-social-care/> [↑](#endnote-ref-13)
13. European Pathway Association. About care pathways. E-P-A Definition of care pathway. Available from: <https://e-p-a.org/care-pathways/> [↑](#endnote-ref-14)
14. Sustainable Healthcare Coalition. 2023. Care Pathways: Guidance on Appraising Sustainability. Available from: <https://shcoalition.org/wp-content/uploads/2024/01/Sustainable-Care-Pathways-Guidance-Summary-December-2023.pdf> [↑](#endnote-ref-15)
15. Lancashire and South Cumbria ICB. 10 Point Green Plan for Practices. Available from:

    <https://www.lancashireandsouthcumbria.icb.nhs.uk/GreenerNHS/primary-care/net-zero-resources/10-point-green-plan-practices> [↑](#endnote-ref-16)
16. NHS England. 2020. Delivering a ‘Net Zero’ NHS. Available from:

    <https://www.england.nhs.uk/greenernhs/a-net-zero-nhs/> [↑](#endnote-ref-17)
17. Zia Ullah Arif. 2024. The Role of Polysaccharide-based Biodegradable Soft Polymers in the Healthcare Sector.

    Advanced Industrial and Engineering Polymer Research. Available from:

    <https://www.sciencedirect.com/science/article/pii/S2542504824000241> [↑](#endnote-ref-18)
18. Unger, Scott R, et al. 2017. Do single-use medical devices containing biopolymers reduce the environmental impacts of surgical procedures compared with their plastic equivalents? Journal of Health Services Research & Policy, 22(4), 218–225. Available from: <https://www.jstor.org/stable/26746994> [↑](#endnote-ref-19)
19. The Born Green Generation Movement. Delivering toxic-free healthcare. Available from:

    <https://www.borngreengeneration.org/#toxic-free> [↑](#endnote-ref-20)
20. East Lancashire Health Economy Medicines Management Board. Lancashire and South Cumbria ICB Formulary for Wound Care Products. Available from:

    <https://elmmb.nhs.uk/www.elmmb.nhs.uk/specialist-formulary/lancashire-and-south-cumbria-wound-care-formulary/index.html> [↑](#endnote-ref-21)
21. Ashour, Ahmed M. Use of Vaping as a Smoking Cessation Aid: A Review of Clinical Trials. Journal of Multidisciplinary Healthcare. 2023. doi: 10.2147/JMDH.S419945. Available from: <https://www.tandfonline.com/doi/abs/10.2147/JMDH.S419945> [↑](#endnote-ref-22)
22. The Health Foundation. 2022. Tackling the inverse care law. Analysis of policies to improve general practice in deprived areas since 1990. Available at:

    <https://www.health.org.uk/publications/reports/tackling-the-inverse-care-law> [↑](#endnote-ref-23)
23. NHS England. 2022. Statistics on NHS Stop Smoking Services in England - April 2022 to December 2022. Available from: <https://digital.nhs.uk/data-and-information/publications/statistical/statistics-on-nhs-stop-smoking-services-in-england/april-2022-to-december-2022> [↑](#endnote-ref-24)
24. Extra Care Housing and Supported Living Strategy. 2016-2025. Cumbria County Council. Available from: <https://cumbria.gov.uk/elibrary/Content/Internet/327/6214/42849133548.PDF> [↑](#endnote-ref-25)
25. Tuso PJ, Ismail MH, Ha BP, Bartolotto C. Nutritional update for physicians: plant-based diets. Perm J. 2013 Spring;17(2):61-6. doi: 10.7812/TPP/12-085. PMID: 23704846; PMCID: PMC3662288. Available from:

    <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3662288/> [↑](#endnote-ref-26)
26. Flores-Balderas X, Peña-Peña M, Rada KM, Alvarez-Alvarez YQ, Guzmán-Martín CA, Sánchez-Gloria JL, Huang F, Ruiz-Ojeda D, Morán-Ramos S, Springall R, Sánchez-Muñoz F. Beneficial Effects of Plant-Based Diets on Skin Health and Inflammatory Skin Diseases. Nutrients. 2023. Available from:

    <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10343921/> [↑](#endnote-ref-27)
27. Diabetes UK. Vegan diets and diabetes. Available from:

    <https://www.diabetes.org.uk/guide-to-diabetes/enjoy-food/eating-with-diabetes/veganism-and-diabetes#:~:text=Vegan%20diets%20and%20diabetes,guidelines%20for%20people%20with%20diabetes>. [↑](#endnote-ref-28)
28. MHRA. 2022. Metformin and reduced vitamin B12 levels: new advice for monitoring patients at risk. Available from:

    <https://www.gov.uk/drug-safety-update/metformin-and-reduced-vitamin-b12-levels-new-advice-for-monitoring-patients-at-risk> [↑](#endnote-ref-29)
29. Plant-Based Health Professionals UK. Available from: <https://plantbasedhealthprofessionals.com/> [↑](#endnote-ref-30)
30. Open Access Government. Implementing digital food menus in hospitals. Available from:

    <https://www.openaccessgovernment.org/implementing-digital-hospital-food-menus/117820/#:~:text=Demonstrating%20it%20is%20a%20step,estimated%20saving%20of%20%C2%A326%2C000> [↑](#endnote-ref-31)
31. Nutritics. Success Stories. How we’ve helped our healthcare customers with our solutions and products. Available from: <https://www.nutritics.com/en/sectors/healthcare/> [↑](#endnote-ref-32)
32. Food for Life. 2024. Lancashire makes commitment to healthy food with two-year Food for Life contract. Available from: <https://www.foodforlife.org.uk/whats-happening/news/news-post/lancashire-cc-ffl> [↑](#endnote-ref-33)
33. Sustainable Food Places. 2024. FoodFutures: North Lancashire's Sustainable Food Partnership. Available from: <https://www.sustainablefoodplaces.org/members/lancaster/> [↑](#endnote-ref-34)
34. Lancashire Telegraph. 2023. Blackburn with Darwen among worst areas for food security in England. Available from: <https://www.lancashiretelegraph.co.uk/news/23475841.blackburn-darwen-among-worst-areas-food-security-england/> [↑](#endnote-ref-35)
35. Fairsare. 2024. Fighting Hunger, Tackling Food Waste. Lancashire & Cumbria. Available from:

    <https://fareshare.org.uk/fareshare-centres/lancashire-and-cumbria/> [↑](#endnote-ref-36)
36. Lancashire and South Cumbria ICB. 2024. Digital support for people in our communities, supporting our primary care services. Available from:

    <https://www.lancashireandsouthcumbria.icb.nhs.uk/our-work/digital-transformation/digital-inclusion> [↑](#endnote-ref-37)
37. Fang YE, Zhang Z, Wang R, Yang B, Chen C, Nisa C, Tong X, Yan LL. Effectiveness of eHealth Smoking Cessation Interventions: Systematic Review and Meta-Analysis. J Med Internet Res. 2023 Jul 28;25:e45111. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10422176/> [↑](#endnote-ref-38)
38. Payne R, Clarke A, Swann N, et al. 2023. BMJ Quality & Safety. Patient safety in remote primary care encounters: multimethod qualitative study combining Safety I and Safety II analysis. Available from: <https://qualitysafety.bmj.com/content/early/2023/11/26/bmjqs-2023-016674> [↑](#endnote-ref-39)
39. NHS England. NHS Diabetes Prevention Programme – digital stream. Available from:

    <https://www.england.nhs.uk/diabetes/digital-innovations-to-support-diabetes-outcomes/nhs-diabetes-prevention-programme-digital-stream/> [↑](#endnote-ref-40)
40. London fire Brigade. ChargeSafe: e-bike and e-scooter safety advice. Available from:

    <https://www.london-fire.gov.uk/safety/lithium-batteries/> [↑](#endnote-ref-41)
41. Lancashire County Council. 2024. Local Cycling and Walking Infrastructure Plans (LCWIPs). Available from: <https://www.lancashire.gov.uk/council/strategies-policies-plans/roads-parking-and-travel/cycling-and-walking-strategy/> [↑](#endnote-ref-42)
42. Possible. Inspiring climate action. 2022. Delayed Responses: The impact of congestion on emergency vehicle response times in London. Available from:

    <https://www.wearepossible.org/latest-news/traffic-is-holding-up-emergency-vehicles> [↑](#endnote-ref-43)
43. NHS North East London. Homerton Hospital to become first Trust to have all-electric ambulances. Available from: <https://northeastlondon.icb.nhs.uk/news/homerton-hospital-to-become-first-trust-to-have-all-electric-ambulances/#:~:text=all%2Delectric%20ambulances-,Homerton%20Hospital%20to%20become%20first%20Trust%20to%20have%20all%2Delectric,electric%20ambulance%20in%20November%202021>. [↑](#endnote-ref-44)
44. Greener Practice. The UK's primary care sustainability network. High Quality and Low Carbon Asthma Care. Available from: <https://www.greenerpractice.co.uk/high-quality-and-low-carbon-asthma-care/> [↑](#endnote-ref-45)
45. Lancashire and South Cumbria Medicines Management Group. Clinical Guidelines. Asthma and COPD.

    Available from: <https://www.lancsmmg.nhs.uk/media/1674/asthma-desktop-guideline.pdf> and

    <https://www.lancsmmg.nhs.uk/media/1054/copd-pathway-version-19-final-1.pdf> [↑](#endnote-ref-46)
46. UK Sustainable Development Unit. Anaesthetic gases research. Available from:

    <https://www.sduhealth.org.uk/documents/publications/Anaesthetic_gases_research_v1.pdf> [↑](#endnote-ref-47)
47. NHS England. 2021. Greener NHS. System progress. Putting anaesthetic-generated emissions to bed. Available from:

    <https://www.england.nhs.uk/greenernhs/whats-already-happening/putting-anaesthetic-generated-emissions-to-bed/#:~:text=Amongst%20anaesthetic%20gases%2C%20desflurane%20is,burning%20440%20kg%20of%20coal> [↑](#endnote-ref-48)
48. American Society of Anesthesiologists Task Force on Environmental Sustainability Committee on Equipment and Facilities. Greening the operating room and perioperative arena: environmental sustainability for anesthesia practice. 2017. Available from:

    from <https://www.asahq.org/about-asa/governance-and-committees/asa-committees/committee-on-equipment-and-facilities/environmental-sustainability/greening-the-operating-room> [↑](#endnote-ref-49)
49. Sustainable Healthcare in Newcastle (SHINE) Report 2021-22. Available from:

    <https://www.newcastle-hospitals.nhs.uk/wp-content/uploads/2022/08/Annual-Shine-Report-2021-to-2022.pdf> [↑](#endnote-ref-50)
50. East Lancashire Hospitals Trust. Case study – Nitrous Oxide: The Great Escape. Available From:

    <https://www.england.nhs.uk/north-west/greener-nhs/case-studies-greener-nhs/case-study-nitrous-oxide-the-great-escape-at-east-lancashire-hospitals-trust/> [↑](#endnote-ref-51)
51. EESI (Environmental and Energy Study Institute). 2021. Fact Sheet | Climate, Environmental, and Health Impacts of Fossil Fuels (2021). Available from:

    <https://www.eesi.org/papers/view/fact-sheet-climate-environmental-and-health-impacts-of-fossil-fuels-2021> [↑](#endnote-ref-52)
52. The Pharmaceutical Supply Chain Initiative. Available from: <https://pscinitiative.org/home> [↑](#endnote-ref-53)
53. Sustainable Healthcare Coalition. Available from: <https://shcoalition.org/> [↑](#endnote-ref-54)
54. Su, Lee-Chun & Xie, Zhiwei & Zhang, Yi & Nguyen, Kytai & Yang, Jian. (2014). Study on the Antimicrobial Properties of Citrate-Based Biodegradable Polymers. Frontiers in Bioengineering and Biotechnology. Available from:

    <https://www.researchgate.net/publication/263935140_Study_on_the_Antimicrobial_Properties_of_Citrate-Based_Biodegradable_Polymers> [↑](#endnote-ref-55)
55. Overcash, Michael. 2012. A Comparison of Reusable and Disposable Perioperative Textiles: Sustainability State-of-the-Art 2012. Anesthesia & Analgesia 114(5):p 1055-1066. Available from:

    <https://journals.lww.com/anesthesia-analgesia/FullText/2012/05000/A_Comparison_of_Reusable_and_Disposable.21.aspx> [↑](#endnote-ref-56)
56. Manzoor MF, Tariq T, Fatima B, Sahar A, Tariq F, Munir S, Khan S, Nawaz Ranjha MMA, Sameen A, Zeng XA, Ibrahim SA. An insight into bisphenol A, food exposure and its adverse effects on health: A review. Front Nutr. 2022 Nov 3;9:1047827. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9671506/> [↑](#endnote-ref-57)
57. Geueke B, Phelps DW, Parkinson LV, Muncke J. Hazardous chemicals in recycled and reusable plastic food packaging. Cambridge Prisms: Plastics. 2023. Available from:

    <https://www.cambridge.org/core/journals/cambridge-prisms-plastics/article/hazardous-chemicals-in-recycled-and-reusable-plastic-food-packaging/BBDE514AAFE9F1ABB3D677927B343342> [↑](#endnote-ref-58)
58. University Hospitals of Morecambe Bay NHS Foundation Trust. 2022. UHMBT launches its first Green Plan. Available from: <https://www.uhmb.nhs.uk/news-and-events/latest-news/uhmbt-launches-its-first-green-plan> [↑](#endnote-ref-59)
59. NHS Lancashire Procurement Cluster (LPC). LPC Procurement Policy. Available from:

    <https://lancashireprocurement.nhs.uk/aim-values/lpc-procurement-policy> [↑](#endnote-ref-60)
60. Tennison I, Roschnik S, Ashby B, et al. Health care's response to climate change: a carbon footprint assessment of the NHS in England. The Lancet Planetary Health 2021. Available from:

    <https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(20)30271-0/fulltext?ref=tageins.at> [↑](#endnote-ref-61)
61. NHS England. 2021. Greener NHS. Blog: One year on from a world-first ambition – let’s stay impatient on the NHS reaching net zero. Available from:

    <https://www.england.nhs.uk/greenernhs/2021/10/blog-one-year-on-from-a-world-first-ambition-lets-stay-impatient-on-the-nhs-reaching-net-zero/#:~:text=For%20the%20emissions%20we%20control,reduction%20by%202036%20to%202039>. [↑](#endnote-ref-62)
62. NHS England. 2023. NHS Net Zero Building Standard. Available from:

    <https://www.england.nhs.uk/wp-content/uploads/2023/02/B1697-NHS-Net-Zero-Building-Standards-Feb-2023.pdf> [↑](#endnote-ref-63)
63. British Lung Foundation. 2018. Toxic air at the door of the NHS.

    <https://cdn.shopify.com/s/files/1/0221/4446/files/PM_Report_FINAL_web_40b0715b-8775-4ee1-a092-2199f9c48a46.pdf?14854756238904833688&_ga=2.227804504.47432139.1543321398-1627606212.1540458037> [↑](#endnote-ref-64)
64. NHS England. 2022. NHS England — Midlands. News. Available from:

    <https://www.england.nhs.uk/midlands/2022/12/29/university-hospitals-of-north-midlands-supports-local-people-living-in-fuel-poverty-while-reducing-its-carbon-footprint/> [↑](#endnote-ref-65)
65. Rapid Transition Alliance. Reclaiming power: The rapid rise of community renewable energy and why the added benefits of local, clean power can help accelerate transition. 2021. Available from:

    <https://rapidtransition.org/stories/reclaiming-power-the-rapid-rise-of-community-renewable-energy-why-the-added-benefits-of-local-clear-power-can-help-accelerate-transition/> [↑](#endnote-ref-66)
66. East Suffolk and North Essex NHS Foundation Trust. 2022. Press Release. We’re turning food waste into green energy’ say hospital bosses. Available from:

    <https://www.esneft.nhs.uk/were-turning-food-waste-into-green-energy-say-hospital-bosses/> [↑](#endnote-ref-67)
67. University College London Hospitals. Climate action and sustainability. Available from:

    <https://www.uclh.nhs.uk/about-us/what-we-do/our-policies-and-statements/sustainability> [↑](#endnote-ref-68)
68. Lancashire County Council. Social value policy and framework 2024-28. Available from:

    <https://www.lancashire.gov.uk/business/social-value/social-value-policy-and-framework/#:~:text=As%20introduced%2C%20social%20value%20considers,services%20from%20the%20Council's%20suppliers>. [↑](#endnote-ref-69)
69. Lancashire Teaching Hospitals. Social value is the opportunity for the organisation to provide ‘added value’ to benefit our local society. Available from:

    <https://www.lancsteachinghospitals.nhs.uk/resources/download/sthk-644154740f4a24.18377308> [↑](#endnote-ref-70)
70. UK Health Security Agency (UKHSA). 2024. Research and analysis. Heat mortality monitoring report: 2022. Available from: <https://www.gov.uk/government/publications/heat-mortality-monitoring-reports/heat-mortality-monitoring-report-2022> [↑](#endnote-ref-71)
71. Donaldson GC, Keatinge WR, Nayha S. Changes in summer temperature and heat-related mortality since 1971 in North Carolina, South Finland, and Southeast-England. Environ Res 2003;91: 1-7. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC192832/> [↑](#endnote-ref-72)
72. Schwartz SEO, Benoit L, Clayton S, Parnes MF, Swenson L, Lowe SR. Climate change anxiety and mental health: Environmental activism as buffer. Curr Psychol. 2022 Feb 28:1-14. Available from:

    <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8883014/> [↑](#endnote-ref-73)
73. Blackpool Teaching Hospitals NHS Foundation Trust. Our Green Plan. 2022 – 2025. Available from:

    <https://www.bfwh.nhs.uk/wp-content/uploads/2022/03/Greenplan-booklet_V4.pdf> [↑](#endnote-ref-74)
74. East Lancashire Hospitals NHS Trust. Green Plan. 2022 – 2025. Available from: from:<https://elht.nhs.uk/application/files/2616/4786/2347/East_Lancashire_Green_Plan.pdf> [↑](#endnote-ref-75)
75. Lancashire and South Cumbria ICB. New Hospitals Programme. Case for Change Hub. 2021. Available from: <https://newhospitals.info/caseforchange> [↑](#endnote-ref-76)
76. Lancashire Climate Action Network. Case Study – Towards a Greener NHS in Lancashire. NHS Lancs and South Cumbria Integrated Care Board. 2023. Available from:

    <https://sites.edgehill.ac.uk/lancscan/resources/case-studies/towards-a-greener-nhs-in-lancashire/> [↑](#endnote-ref-77)
77. European Parliament. In-Depth Analysis. The link between biodiversity loss and the increasing spread of zoonotic diseases. Available from: <https://www.europarl.europa.eu/RegData/etudes/IDAN/2020/658217/IPOL_IDA(2020)658217_EN.pdf> [↑](#endnote-ref-78)
78. South Ribble Borough Council. Biodiversity Action Plan. Available from:

    <https://www.southribble.gov.uk/article/2805/Biodiversity-Action-Plan> [↑](#endnote-ref-79)
79. Royal Cornwall Hospital NHS Trust. Our Building Programme. Biodiversity and sustainability. Available from:

    <https://royalcornwallhospitals.nhs.uk/our-hospitals/building-programme/> [↑](#endnote-ref-80)
80. McQerry et al. 2020. Disposable versus reusable medical gowns: A performance comparison. American Journal of Infection Control. Available from: <https://www.sciencedirect.com/science/article/pii/S0196655320309299> [↑](#endnote-ref-81)
81. University of Plymouth. 2019. Hospital gowns retain superbugs even after disinfectant use, research shows.

    Press Release. Available from:

    <https://www.plymouth.ac.uk/news/hospital-gowns-retain-superbugs-even-after-disinfectant-use-research-shows> [↑](#endnote-ref-82)
82. Health Innovation North West Coast. A Health Innovation North West Coast report for the NHS England Net Zero and Sustainable Procurement Team. Case Study: Available from: <https://www.healthinnovationnwc.nhs.uk/media/News/2024/REUSABLE%20SURGICAL%20GOWNS%20REPORT%20Jan%2024.pdf> [↑](#endnote-ref-83)