C7: Greener healthcare: seeing waste and leading for sustainable healthcare - case studies from across the globe

Session C7
Greener Healthcare: Seeing Waste and Leading for Sustainable Healthcare-
Case Studies from Across the Globe

Maureen Bisognano

17 May 2023

Welcome!

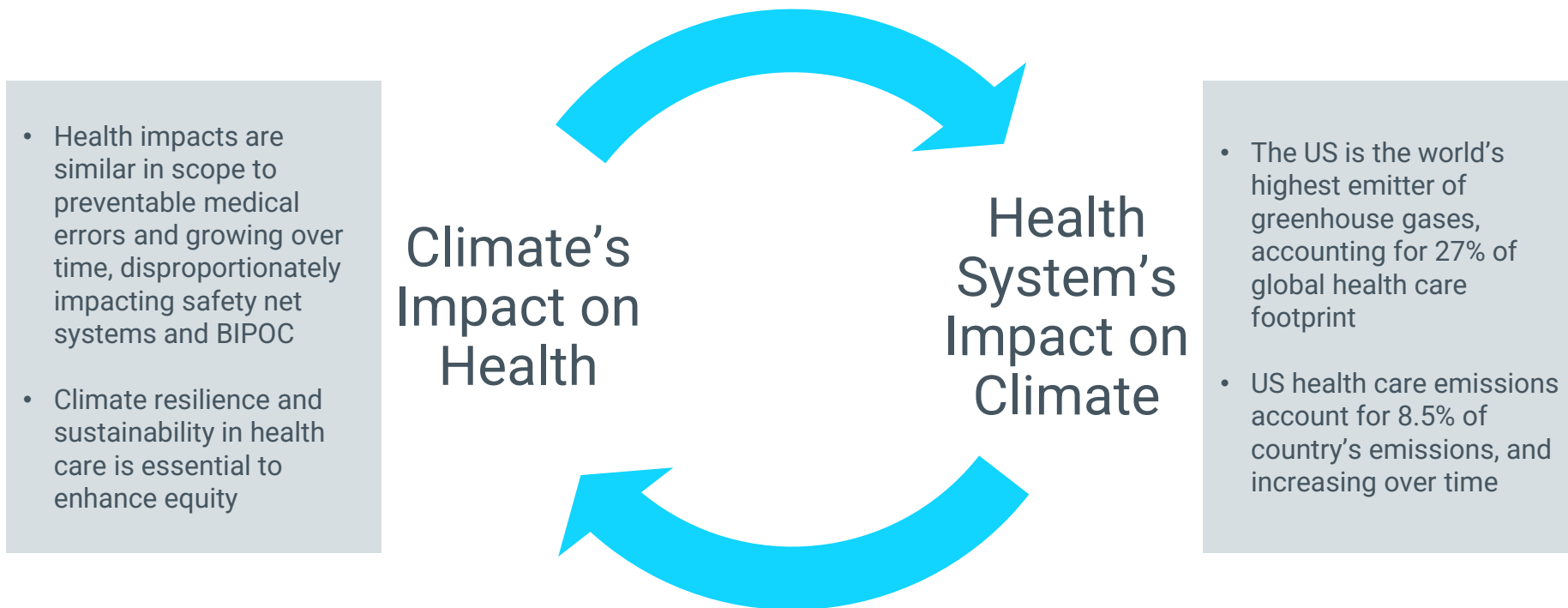## Please find yourself a seat at an available table and make yourself comfortable.

Please also introduce yourself to your table mates!

Objectives for this session

- Highlight the link between health, healthcare, climate change and environmental challenges

- Highlight the waste in care design and delivery and poorer experience for staff and patients; a greater triple-line cost of resources.

- Discuss strategies and approaches to quantify the impact of waste in healthcare Identify opportunities that exist right now to make a positive change by minimising the impact of healthcare waste on our environment

Climate Change Has A Direct Impact On Population Health, But The Health System Also Contributes To The Problem

Climate's Impact on Health

Health System's Impact on Climate

- Health impacts are similar in scope to preventable medical errors and growing over time, disproportionately impacting safety net systems and BIPOC

- Climate resilience and sustainability in health care is essential to enhance equity

- The US is the world's highest emitter of greenhouse gases, accounting for 27% of global health care footprint

- US health care emissions account for 8.5% of country's emissions, and increasing over time

While The Full Toll Of Climate Change Is Hard To Measure, It Is Clear It Has Huge Human Health Impact

In 2020, there were approximately 32,000 deaths in the US resulting from exposure to air pollution, with 37% driven by the burning of fossil fuels

Disease-transmitting ticks and mosquitos are thriving in new parts of the U.S. and for greater portions of the year, with the length of time mosquitos can spread dengue up 48% from 1951–60 to 2012–20

Approximately 5,600 heat-related deaths occurred each year from 1997–2006 in 297 counties where more than 60 percent of Americans live

In 2020, a study found that 68% of U.S. adults reported having at least some anxiety about climate change

The Commonwealth Fund

Higher Costs, Reduced Access, And Heightened Racial Disparities Are Just Some Of Climate Change's Impacts

Costs

As climate change and air pollution worsen the health of millions more people each year, it also pushes up health care costs due to caring for those with immediate impacts as well as those with new or exacerbated illnesses

Equity

Climate change deepens preexisting inequities by taking the greatest toll on those already at heightened risk, such as those with low incomes, people of color, older adults, and children

Access

Extreme climate events lead to disruptions in care through hospital evacuations or closures, power outages, and damaged roads or transit systems that prevent people from getting to health facilities

Quality

When some hospitals are forced to close, others can become overcrowded with the boarding of patients in EDs which is associated with decreased quality of care. In addition, supply chain disruptions may reduce the availability of critical medicines or medical devices

The Commonwealth Fund

External Environment: Momentum Building To Decarbonize Health System

Unprecedented attention on the issue has created a window of opportunity:

- NAM collaborative has raised profile, though little progress to date
- COP26 Health Programme has created potential international partners (especially for Scope 3) and opportunities for learning, though progress is mixed across countries
- Unprecedented funding provided in IRA that health systems can access to fund/ accelerate their work
- White House/HHS calling on health sector to make pledge has many publicly committed; need to increase the number
- Creation of Office of Climate Change and Health Equity provides natural home for this work as they work across HHS, though hasn't been funded
- Ways & Means RFI, hearing, and reports further amplified the issue and provides insights into what health systems are facing on mitigation and resiliency
- SEC ESG reporting requirements put pressure on publicly traded health sector entities, important to progress on Scope 3

The Commonwealth Fund

For Health Systems, There Are Several Initial Steps They Can Take

Health Systems looking to reduce their climate impact should consider:

- Making a public commitment, such as the White House/HHS pledge, with clear targets for emission reductions

- Performing full accounting of organizational GHG emissions (baseline and regular tracking)

- Adopting a climate action plan to reduce emissions

- Appointing executive leadership responsible for climate change accounting, mitigation, and adaptation performance

- Adopting governance that includes board-level oversight, reporting, and stewardship accountability

- Engage their workforce, supporting them with appropriate training

- Engaging in networks to share best practice and learn from others

The Commonwealth Fund

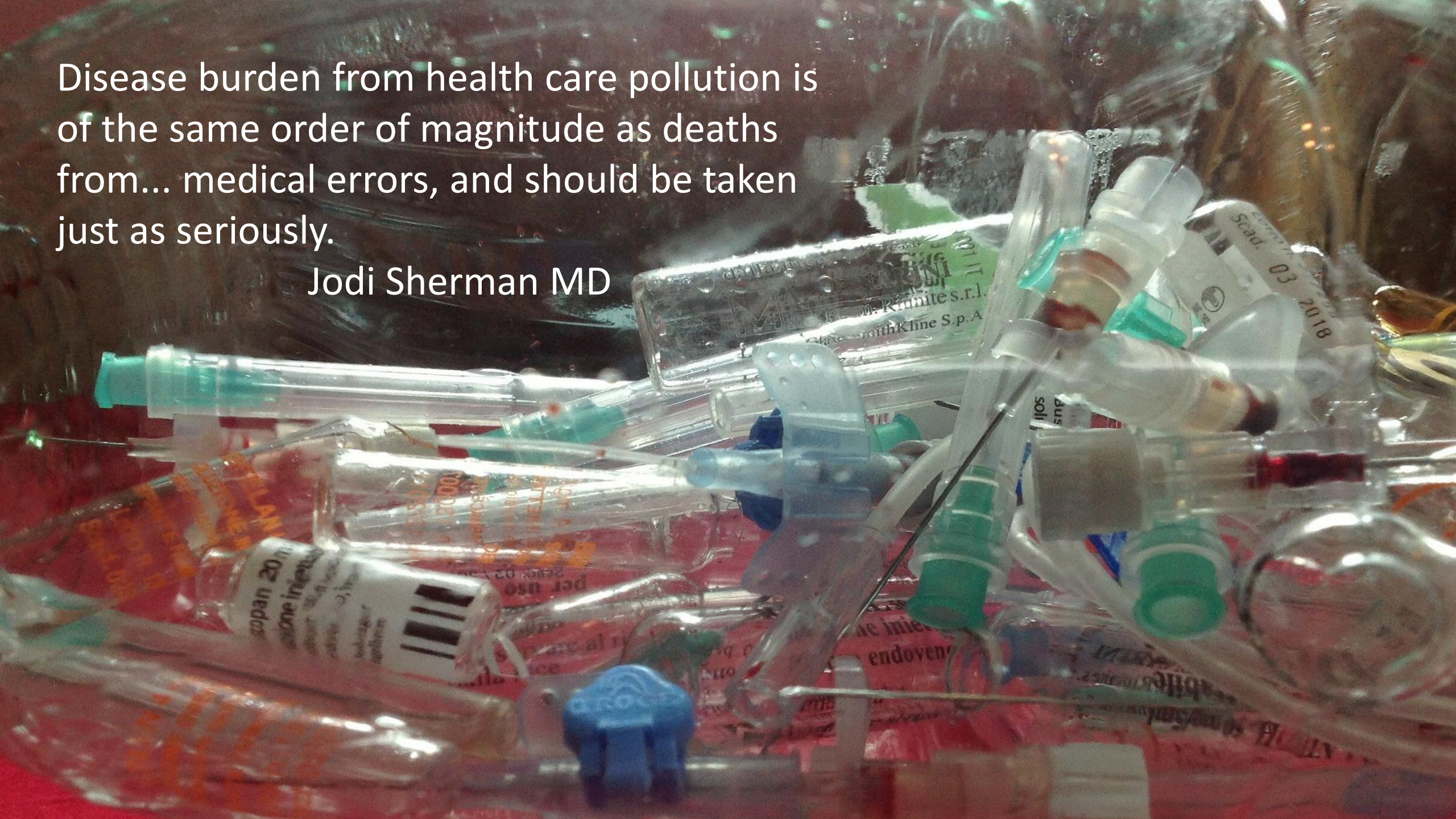# The NHS Is Leading The World In Health System Decarbonization

- The UK's NHS is the world's first health care system to commit to achieve net-zero carbon emissions with aims to reach net-zero emissions:
  - For emissions the NHS controls directly by 2040 and
  - For emissions the NHS only influences by 2045

- The Greener NHS program, launched in October 2020, offers a roadmap of actions the NHS is taking and will take to cut its emissions, with support and oversight from the national team

- The plan was developed by:
  - Measuring total system emissions
  - Identify both short- and long-term evidence based, high impact strategies to reduce emissions across buildings, operations, and care delivery
  - Setting reduction targets and tracking progress

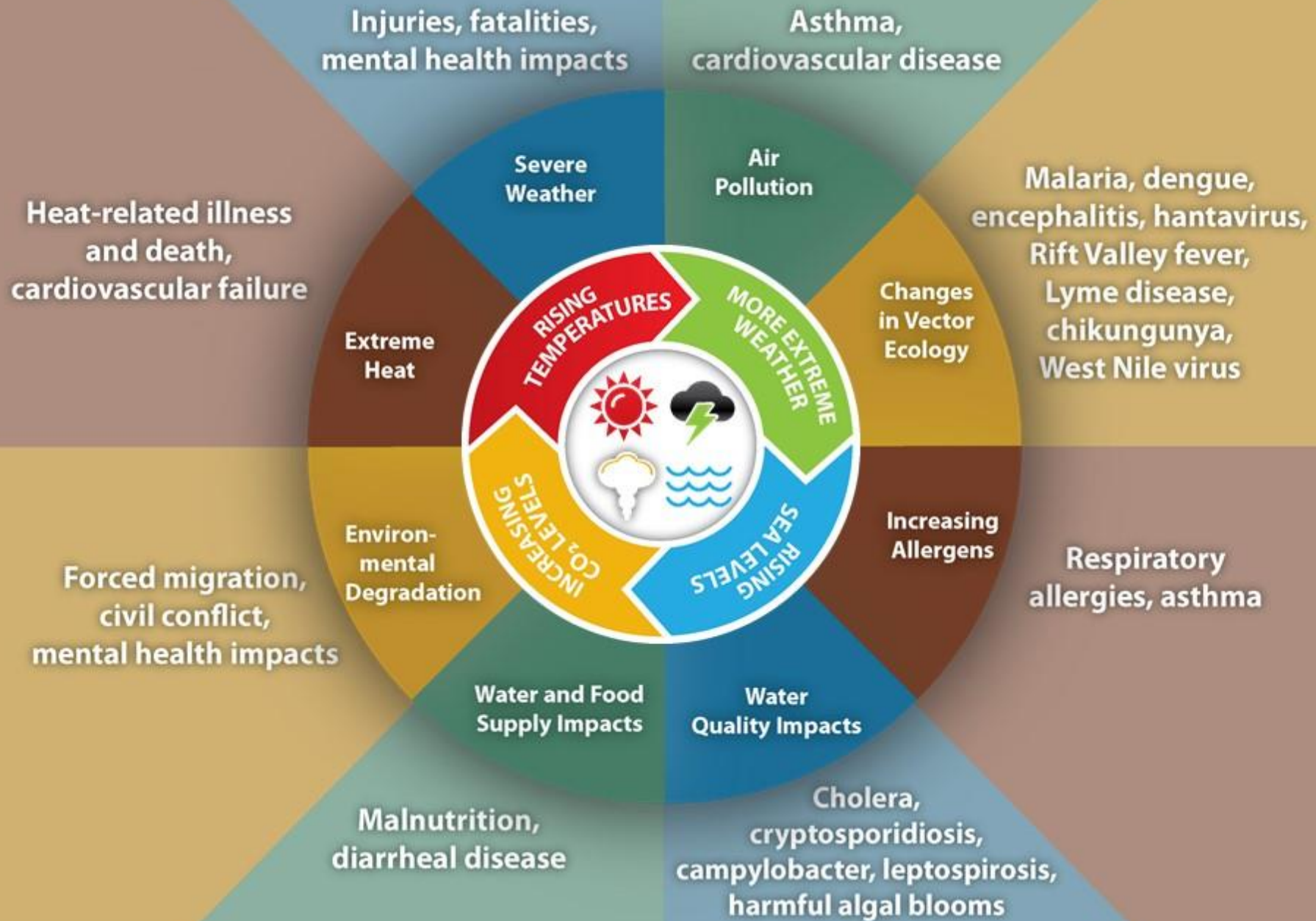The Commonwealth Fund

Action The NHS Is Taking

- **Key actions in the NHS include:**

  - **Switching to lower carbon inhalers and anesthetic gases** – which accounted for around 25% of NHS emissions

  - **Lowering impact of hospital buildings and facilities** – upgrading to LED lighting, intelligent energy monitoring systems and net-zero requirements for all new builds

  - **Procurement strategies with aligned companies** – from April 2022 all procurement have had to consider Net Zero and wider social value requirements, with all suppliers expected to demonstrate progress to net zero by 2030

  - **Lower emissions travel and transport** – through fleet upgrades, improve public transport and more telehealth

  - **New models of healthcare** – with a greater focus on prevention and management of long term conditions to reduce overall demand for healthcare

  - **Engage all levels of the health care workforce** (around 1.2m people) – in personal action and delivering system changes

  - **Governance to oversee progress** – with a new Chief Sustainability Officer and regular reporting to the Board on progress

  - **Supporting innovation** – including spread of digital innovation and decarbonization specific awards

The Commonwealth Fund

Disease burden from health care pollution is of the same order of magnitude as deaths from... medical errors, and should be taken just as seriously.

Jodi Sherman MD

Impact of Climate Change on Human Health

Injuries, fatalities, mental health impacts

Asthma, cardiovascular disease

Heat-related illness and death, cardiovascular failure

Malaria, dengue, encephalitis, hantavirus, Rift Valley fever, Lyme disease, chikungunya, West Nile virus

Forced migration, civil conflict, mental health impacts

Respiratory allergies, asthma

Malnutrition, diarrheal disease

Cholera, cryptosporidiosis, campylobacter, leptospirosis, harmful algal blooms

Severe Weather

Air Pollution

Changes in Vector Ecology

Increasing Allergens

Water Quality Impacts

Water and Food Supply Impacts

Environ-mental Degradation

Extreme Heat

RISING TEMPERATURES

MORE EXTREME WEATHER

SEA LEVELS RISING

INCREASING CO_2 LEVELS

US Centers for Disease Control and Prevention

REDUCE

REUSE

Everything outside the blue blanket, will be fased out within 6 months.

TEXTILES

Single use >< multiple use

- 3 mio. protective clothing in 2020 (300,000 in 2019)

- 1 million OP / liquid-tight gowns

- Economy?

- Security of supply?

- Work environment?

- PFAS?

- Preliminary project with the Danish Environmental Protection Agency
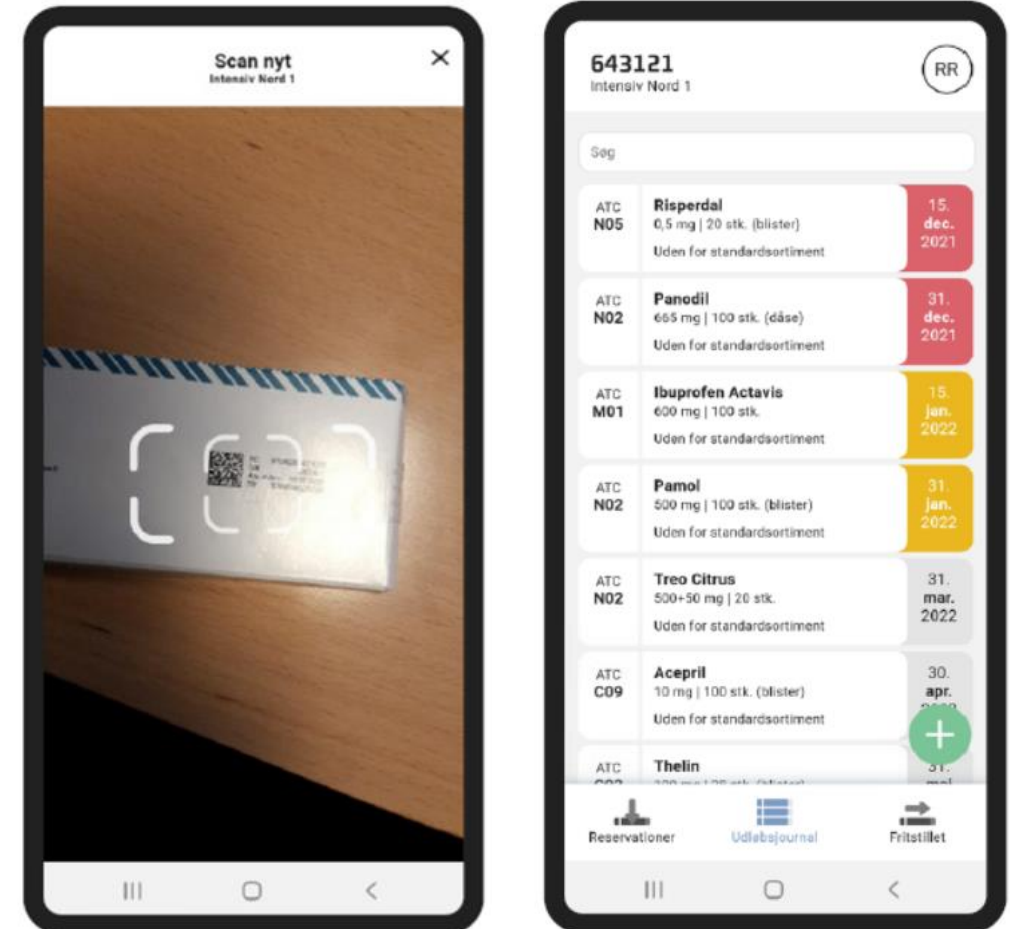
- Goal: 50% reduction of disposable textiles 300.000 tons pr./year

Pharma-app

How might digitalisation help us reduce consumption?

- Color-coded list of products with date of expire

- Time-saving for staff

- Development cost: 133.000 Euros.

- In 2022 reduced medicin waste for 173.000 Euros

  in just one hospital.

What can you do?

- Reduce unnecessary examinations, drugs and single use items

- Reduce the use natural resources – move to green power, stand down theatre air systems overnight, find alternative to gases

- Reduce unnecessary use of PPE – gloves, move to reusable and washable

- Maximise use of technology to use video-consultation and patient-initiated follow-up

- Move to more vegetarian options in non-plastic multi-use packaging

Defining 'waste'

noun
- 'Material or resources which are expended carelessly, extravagantly, or to no purpose'

verb
- 'To use or expend carelessly, extravagantly, or to no purpose'

'Fail to take advantage of an opportunity'

The Free Dictionary

HIAE working group: Ideas shared by the group from experience and local context

- **Wasted time and resource in the system**: meetings, approaches to data collection, clinical drug rounds, IV ABs and nursing staff time, theatres redundant non-working time, community resources, hospital admission and discharge processes.

- **Wasted time of patients and families**: precious time of some patients and families at critical time of treatment plans, impacting on quality of life. Waiting for services, delays in appts.

- **Wasted time of staff (and development opportunities):** be more co-productive with our patients in decision making - what people want rather than what the system thinks they need. Psychological safety and impact on joy in work including recruitment and retention. The professional roles and enabling people to deliver better e.g. support staff in community services/development of roles and appropriate pay/compensation.
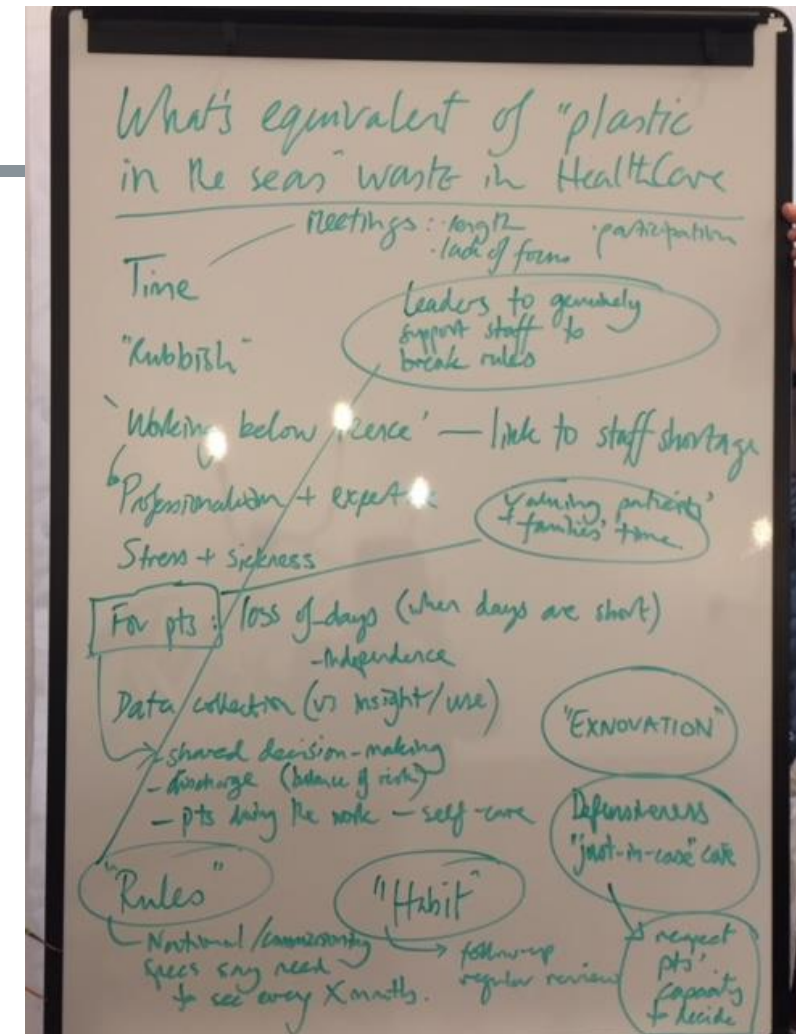
Exploring the different types of waste we see in the system and the impact it has

Wasted resources and processes

Wasted time patients, carers, staff

Wasted spirit and opportunities for staff

Trillion Dollar Checkbook

1. Reduce harm & safety events
2. Reduce non-value added operational workplace waste
3. Reduce non-value added clinical workplace waste
4. Solicit staff and clinician ideas
5. Involve patients in identifying what matters most
6. Redesign care to achieve Triple Aim

Trillion Dollar Checkbook

IHI Leadership Alliance

Innovation – Spread - Exnovation

Innovation

- Where are care models and processes broken?
- Where do we need new thinking?
  - Innovation labs, design processes
  - Harvesting

Spread

- Where do we see variation in performance?
- How can we reliably spread to ensure that we can provide the best care to every patient, where they are?
 - Transparent data
  - Curiosity
  - Spread Model

Exnovation

- How do we stop what doesn't work anymore?
- How will we eliminate wasteful practices and processes?
- **It takes courage!**

Exnovation and Undiffusion

- Established procedures can be hard to abandon, even when evidence for change is strong
  - Preference for what is familiar
  - Cost of training and new equipment can be a barrier

- Speed and shape of undiffusion
  - Not a perfect reverse S curve
  - Conflicting data can affect rate of undiffusion
  - Late adopters of old standard are often the first to Exnovate
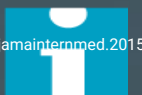
EXNOVATE TO INNOVATE

VIRTUAL WORKING FREES UP......

Office space, travel, staff time, reduces Co2 omissions, reduces DNA's, save patients time, reduces issues of childcare/time out of work

COMMUNICATIONS & TECHNOLOGY HELP US TO.....

Improve contact with families, reduce interruptions on ward, reduce paper (NIECR), promote self-care (InHealth), empower parents, access info (QR codes), access training, remote triage (dermatology), support tissue viability team

PREDICTIVE DATA LETS US.....

Model medicines for critical care, palliative care & respiratory, O2 usage, fluids, identify the appropriate form of respiratory support (Airvo, CPAP), PPE usage

NEW MODELS OF SERVICES WHICH ARE WORKING WELL......

Hospital at Day, EMSU (inc. direct access for GPs), Gynae assessment unit, Radiology hot reporting, reduction in duplication of tests, improved triage (supporting discharge from waiting list), EQiP, on-line rehab (cardiac), insulin shots in pregnancy, digital corporate welcome, removal of cash counting

"There is no power for change greater than a community discovering what it cares about"
(Meg Wheatley, Leadership & the New Science)

Think of all opportunities lost because of the **CHOICE** to take the "easy path".

Implementation and de-implementation: two sides of the same coin?

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ABSTRACT

Avoiding low value care received increasing attention in many countries, as with the Choosing Wisely campaign and other initiatives to abandon care that wastes resources or delivers no benefit to patients. While an extensive literature characterises approaches to implementing evidence-based care, we have limited understanding of the process of de-implementation, such as abandoning existing low value practices. To learn more about the differences between implementation and de-implementation, we explored the literature

implementation and de-implementation in the people who are most likely to lead (or resist) these efforts.

BACKGROUND

In recent decades, abandonment of low value care has become more important in many countries. Evidence shows for example that an estimated 30% of all medical spending in the USA is unnecessary, and does not add value in care.[1] The importance of abandoning low value care is underscored by the Choosing

Source: van Bodegom-Vos L, Davidoff F, Marang-van de Mheen PJ, Implementation and de-implementation: two sides of the same coin? *BMJ Quality & Safety* 2017;26:495-501.

Perspective

Getting Rid of Stupid Stuff

Melinda Ashton, M.D.

Many health care organizations are searching for ways to engage employees and protect against burnout, and involvement in meaningful work has been reported to serve both functions. According to Bailey and Madden, it is easy to damage employees' sense of meaningfulness my colleagues and I had reason to believe that there might be some documentation tasks that of the beholder. Everything that we might now call stupid was thought to be a good idea at some point."

We thought we would probably receive nominations in three categories: documentation that was never meant to occur and would require little consideration to elim-

Status of "Getting Rid of Stupid Stuff" Requests from Nurses and Physicians.*

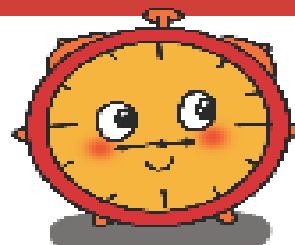| Status	Nurses	Physicians
	no. of requests (%)	
Completed	68 (46.6)	19 (45.2)
Not possible	18 (12.3)	8 (19.0)
In progress	27 (18.5)	2 (4.8)
Assigned to work groups or not yet started	33 (22.6)	13 (31.0)

* Does not include 31 suggestions from other disciplines or related to issues other than improvements to electronic health records.

#endpjparalysis: connected social communities

"TIME" is the most important currency to patients & staff

Don't WASTE
What can't be REPLACED

Frustrations of waste

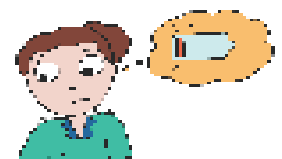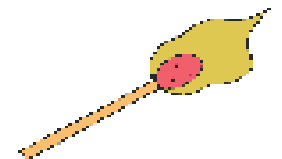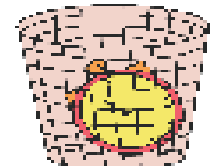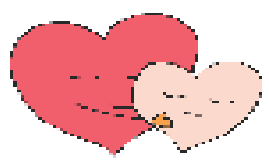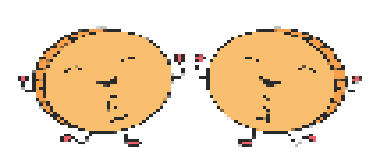|					
Patients and loved ones have "sleepless" nights worrying and waiting for results	Patients are wasting time away from family due to unnecessary delays in care	Staff are exhausted from non-value tasks that lead to a waste of their talent	Disjointed teams can lead to duplication and burnout.	Too many steps are wasted on things that are not beneficial e.g. paper forms	Precious time is wasted on things that can lead to defects/errors
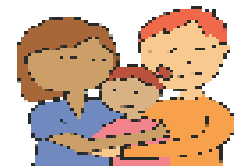
Expected benefits

By reducing waste, you can improve your enjoyment at work	Working together to understand what matters to staff & patients	Improving quality & reducing waste naturally leads to efficient use of resources	Involving you can lead to changes that make a difference to you	Free up staff time, effort, energy and focus more on what matters most	You clear the runway – people spend too much time on things that don't matter
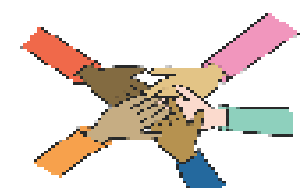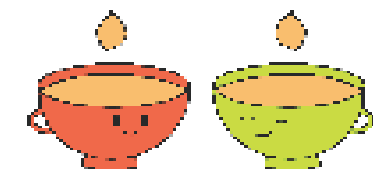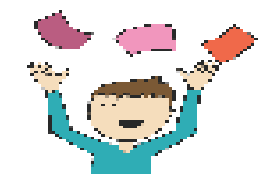
What HIAE did

Health Improvement Alliance Europe

Alliance members working together to improve value and eliminate waste	Be more green! Waste has an impact on all of us. We all contribute to or create waste		Focused on creativity, positive energy, celebrating success and enjoying work	Focused on understanding "what matters to you" & learning from each other	Had a QI based approach for learning. Examples of reducing waste are in this playbook.
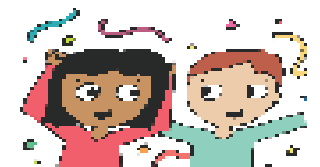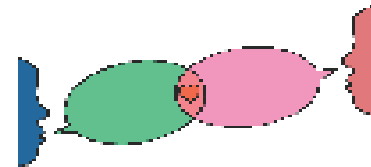
Some tips for you
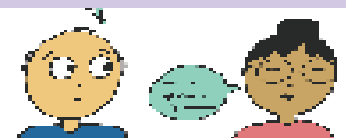
Use the right language to connect with a wide range of people & create inclusion	Co-produce with patients & the community, be open and honest with them	Focus on understanding what matters most, we can all learn from each other's experiences	Don't let waste go unchallenged. It will take time to make the changes happen	When you put quality first, cost reductions can often follow	Significant learning can be gained from visiting other hospital sites
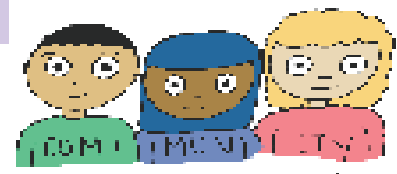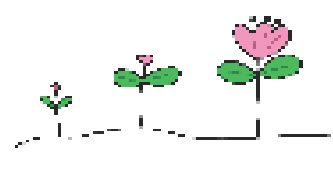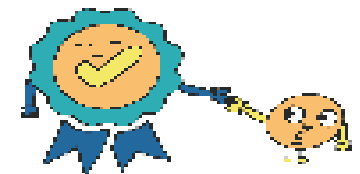
"By early 2012, we were able to convert virtually all of our IV medical equipment, including more than 9 million solution bags to PVC- and DEHP- free alternatives"

Cathy Gerwig
Greening Health Care

Changes during Covid

- Virtual care
- Process changes
- Environmental changes
- Keeping staff safe & working
- Workforce

Figure 2
NHSCT – COVID interventions

Aim:
Respond to COVID-19, providing safe and appropriate services for patients whilst keeping staff safe

Patient Care & Operations

Staff Support & Wellbeing & Workforce

Virtual Care
Options for connectivity (telephone and on-line) to support:
- Triage
- New and Review appointments
- Cardiac Rehab on-line, diabetes prevention programme, COVID anticipatory care planning
- 'How to do' training sessions for parents with Speech & Language therapy
- Virtual Ward Rounds in Antrim and Care Homes
- InHealth App for patient self-management
- Virtual Visiting
- QR Codes to access patient pathway information in maternity
- Skin photo triage
- Virtual insulin starts

Process Changes
In many cases enabled by technology or environmental changes:
- Family Liaison Service
- No 'clerking-in' in ED – patients straight to wards
- Colorectal QFIT testing
- Hospital at Day
- Radiology Hot reporting (24/7 reporting)
- Trust-wide Daily Phlebotomy clinics
- Helplines for Haematology, Diabetes, Pregnancy
- Increased use of NIECR for information sharing
- Inpatient heart failure service introduced
- Streamlined working with voluntary agencies for Care of Elderly and Stroke
- Withdrawal of Paeds and Maternity services from CAU
- Pharmacy top-ups in ED
- Discharging low risk patients from some services
- Scaling-up pharmacy palliative care service
- Ordering and supply of PPE and critical medicines
- Revision of range of protocols/procedures for care delivery
- Anticipatory medicines for care homes
- Infection Prevention Control and decontamination
- New shift patterns for dialysis patients
- Partner Hub established
- Support to those living alone through Community Hubs
- Programme of support to Care Homes
- New model to support those using opiate substitute treatment
- Finance and procurement

Environmental Changes
- New ICU in Antrim (20 beds)
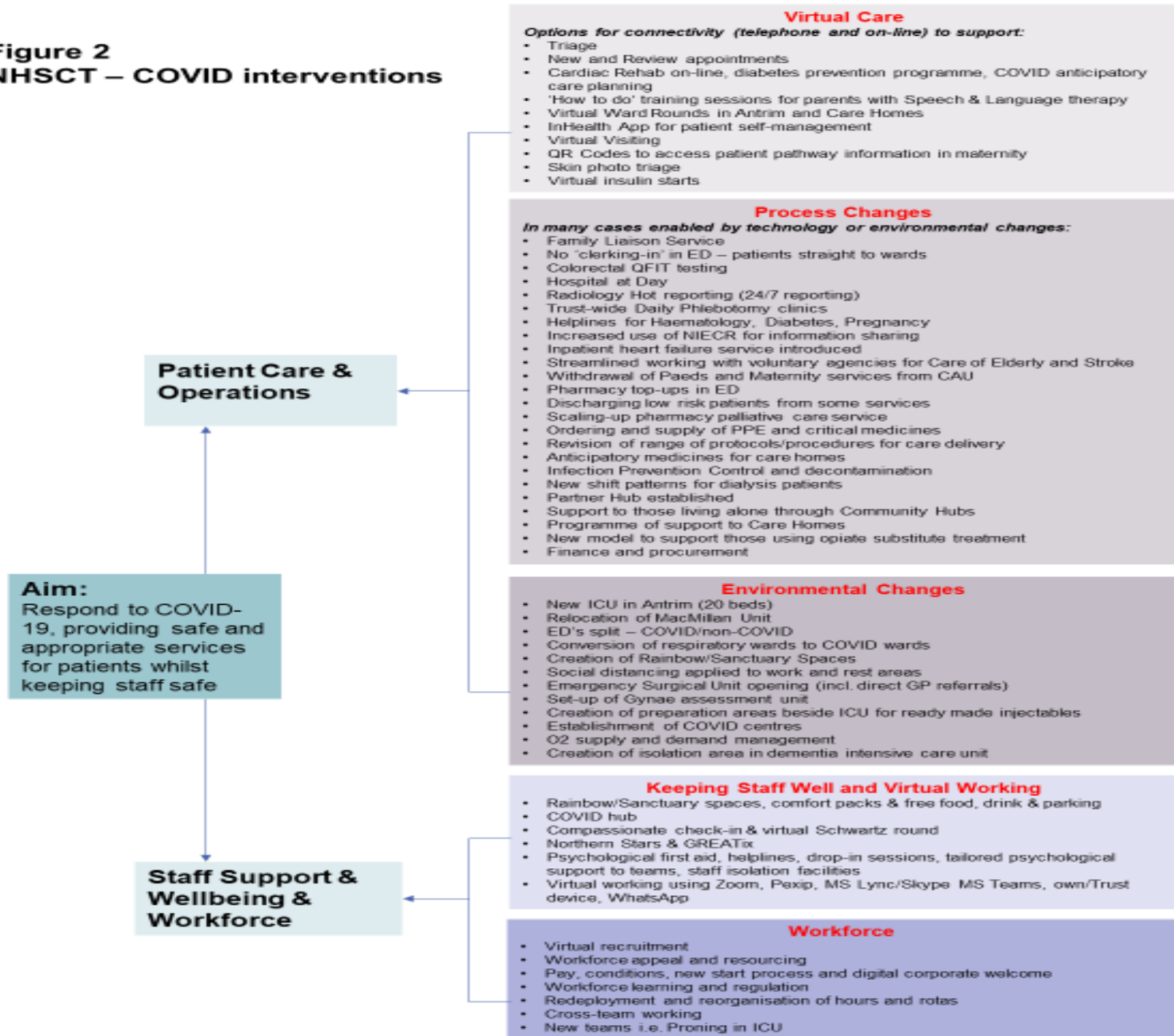- Relocation of MacMillan Unit
- ED's split – COVID/non-COVID
- Conversion of respiratory wards to COVID wards
- Creation of Rainbow/Sanctuary Spaces
- Social distancing applied to work and rest areas
- Emergency Surgical Unit opening (incl. direct GP referrals)
- Set-up of Gynae assessment unit
- Creation of preparation areas beside ICU for ready made injectables
- Establishment of COVID centres
- O2 supply and demand management
- Creation of isolation area in dementia intensive care unit

Keeping Staff Well and Virtual Working
- Rainbow/Sanctuary spaces, comfort packs & free food, drink & parking
- COVID hub
- Compassionate check-in & virtual Schwartz round
- Northern Stars & GREATix
- Psychological first aid, helplines, drop-in sessions, tailored psychological support to teams, staff isolation facilities
- Virtual working using Zoom, Pexip, MS Lync/Skype MS Teams, own/Trust device, WhatsApp

Workforce
- Virtual recruitment
- Workforce appeal and resourcing
- Pay, conditions, new start process and digital corporate welcome
- Workforce learning and regulation
- Redeployment and reorganisation of hours and rotas
- Cross-team working
- New teams i.e. Proning in ICU

Up to 90% of orally administered pharmaceuticals are excreted into wastewater as active substances in the faeces and urine of patients

https://noharm-europe.org/documents/pharmaceutical-residues-hospital-wastewater

# Case Story: Implementation of a Blood Conservation Program

A high-volume surgical program implemented a **blood conservation pilot program** using the Patient Centered Value System (PCVS). These teams were able to capture the actual cost drivers of performing a transfusion, from additional staff and patient time required for inpatient and outpatient testing, to the cost of sourcing a unit of blood from the blood bank.

Shadowing enabled the process improvement team to quantify and understand the resulting clinical, systematic, and financial burden on patients, staff, and clinicians due to transfusions.

With the adoption of a comprehensive blood management (CBM) protocol, blood transfusion rates in the orthopaedic program decreased from **14% to 2%** for total knee replacement surgery and **9% to 1%** for total hip replacement surgery.

Eliminating blood transfusions allowed the department to discontinue lab draws, which resulted in an annual savings of over **$500,000** and **reduced** hospital length of stay by **0.9 days.**

These savings, in addition to eliminating the need to source the units of blood, led to annual cost savings of more than **$750,000** in just one department.

14%
2%
Total Knee Replacement Surgery

9%
1%
Total Hip Replacement Surgery
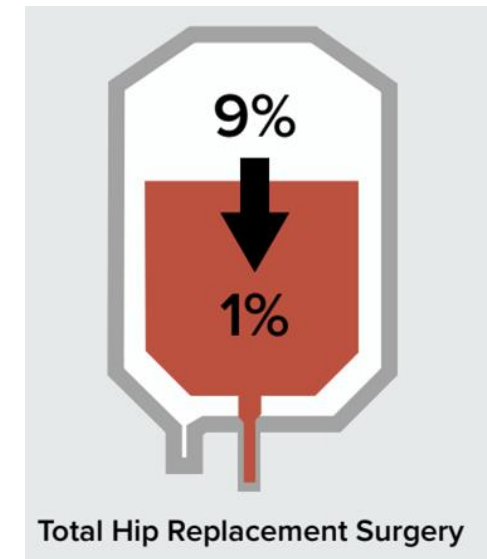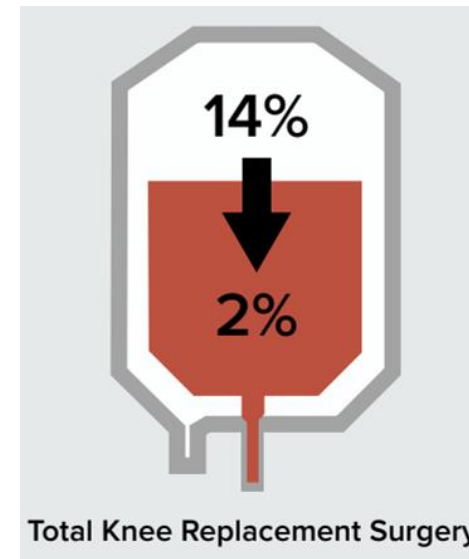
" You must unite behind the science. You must take action. You must do the impossible. Because giving up can never be an option."

Greta Thunberg
US Congress. Washington DC. 17 September 2019

Be curious about what your healthcare organisation is doing to support climate change

Find new ways to measure environmental impact as a routine metric of change

Look at all improvement projects through an environmental impact lens

Commit to change one small thing at home or at work

Have positive conversations about climate change

Some helpful resources

- **Model to Reduce Waste in Healthcare and Add Value, BMJ Open Quality (2022)** [Model to reduce waste in healthcare and add value | BMJ Open Quality](#)

- **Podcast - Saving the planet – reducing healthcare waste to improve environmental impact** [Stream episode Gill Smith And Elaine Mead by National Elf Service podcast | Listen online for free on SoundCloud](#)

- **OECD (2017), Tackling Wasteful Spending on Health, OECD Publishing, Paris :https://dx.doi.org/10.1787/9789264266414-en**

Some helpful resources

- **Delivering a Net Zero NHS** (2020), NHS England and Improvement https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2020/10/delivering-a-net-zero-national-health-service.pdf

- Bueno B, Leo JD, Macfie H. IHI Leadership Alliance. **Trillion Dollar Checkbook: Reduce Waste and Cost in the US Health Care System**. Boston: IHI, 2019 (available at www.ihi.org).

- Climate Ergonomics - embedding sustainability into everyday business.pdf

Thank you