Irish College of GPs

May 2023

Glas Toolkit

Glas = Green in the Irish language

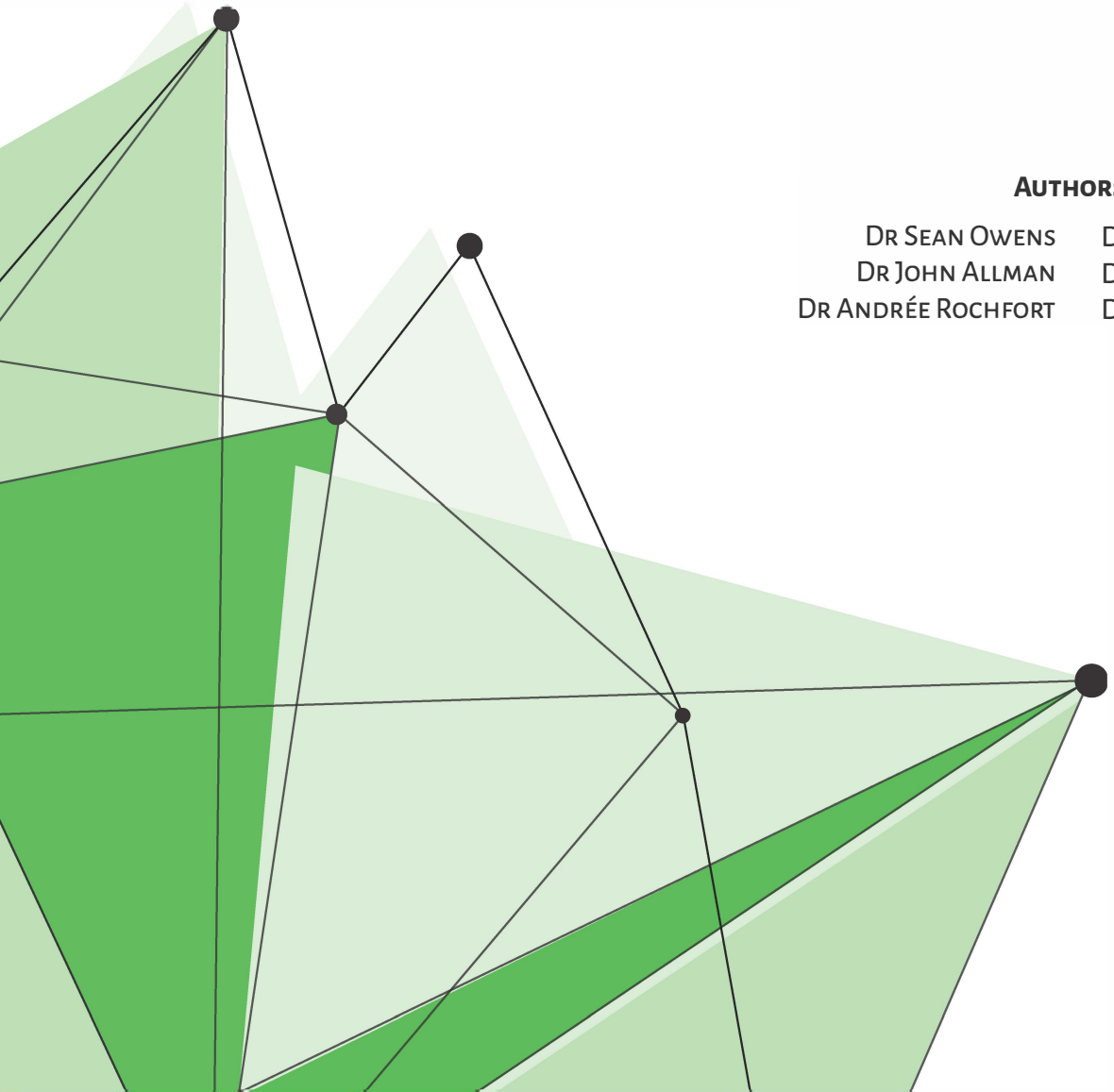

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Table of Content

List of Figures

List of Tables

About these authors and about this toolkit

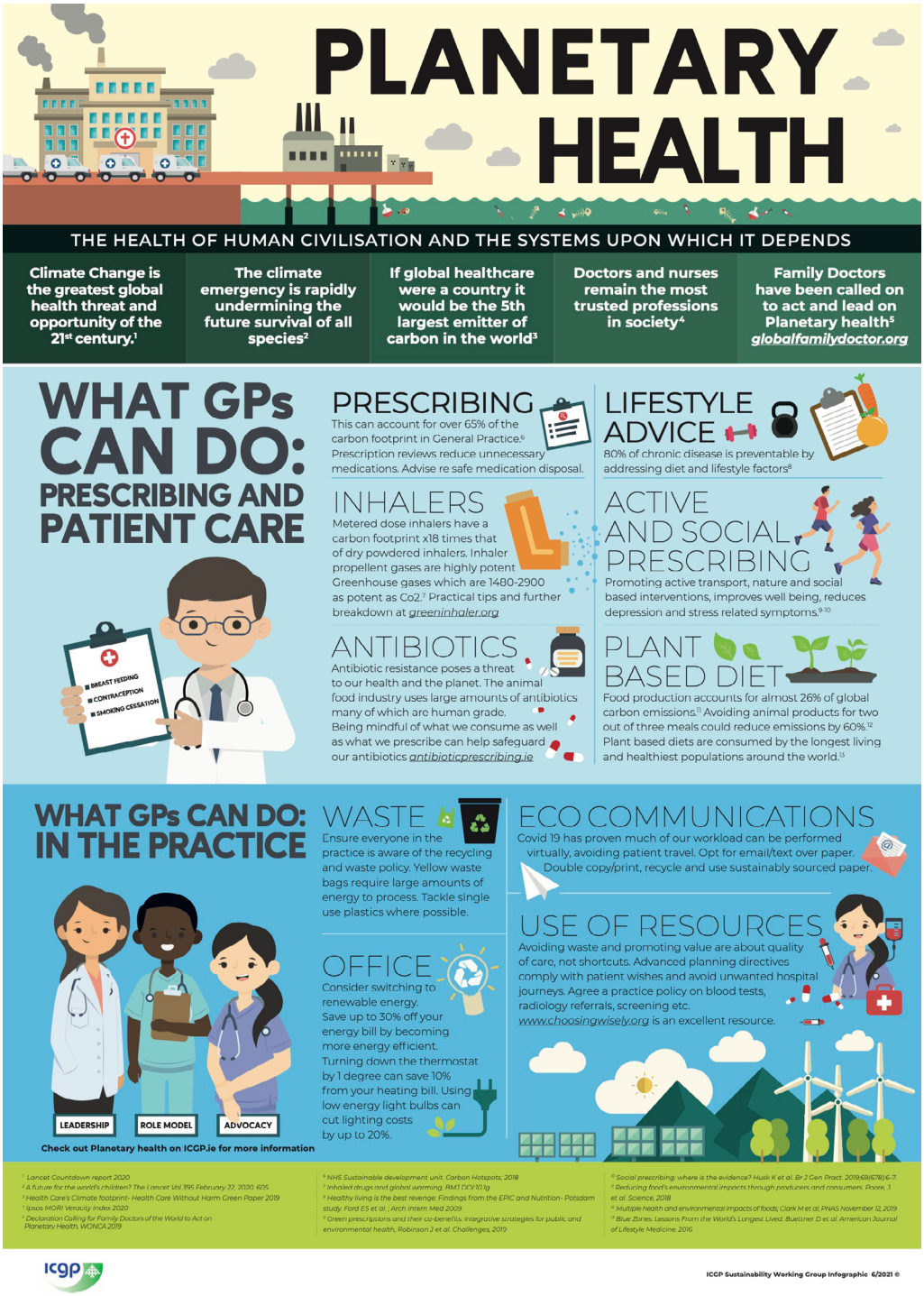

Figure 1. Irish College of General Practitioners Sustainability Working Group Infographic 6/2021 ©

The Irish College of General Practitioners (ICGP) Sustainability Working Group was formed in Summer 2020 to raise awareness among general practitioners, practice nurses and practice staff of the need to consider the environment and the future sustainability of healthcare delivery to our patients. The group consists of an ICGP Council member, a WONCA representative, a GP trainer, a new and emerging GP, an assistant GP and a GP trainee, representing all parts of Ireland as fairly as possible with respect to age, gender, location, and experience.

The Sustainability Working Group members have forged links with other primary care disciplines both at home in Ireland and abroad. They have actively liaised with the HSE sustainability strategy, the HSE social prescribing initiative, worked with and contributed to output from the Climate Health Alliance, collaborated with Irish Doctors for the Environment, the newly formed European Hub of the Planetary Health Alliance, EQuiP- WONCA Europe: the Network for Quality and Safety in GP care in Europe, and the WONCA Working Party for Environment. WONCA is the World Organisation of National Colleges, Academies and Academic Associations of general practice / family medicine.

Please meet the team.

Dr Sean Owens

Dr Sean Owens is a full-time GP working in Blackrock, Co. Louth. Sean has a special interest in nutrition, lifestyle medicine and planetary health. Hailing from County Down, Sean initially studied pharmacy at Queens University Belfast before relocating to Dublin to practise community pharmacy in 2005. In 2010 Sean elected to study graduate entry medicine in UCD Dublin, 2010-2014 and has graduated from the North East GP Training Scheme 2019. Sean has additional diplomas in Lifestyle Medicine and Women's Health. Sean is delighted and enthused to chair the Sustainability Working Group and feels the GLAS toolkit is a fantastic way for Irish based GPs and nurses to lead the way to a healthier and more sustainable future.

Dr Aoife Benton

Dr Aoife Benton graduated from Medicine from Galway University.

She is a lifelong nature lover and acknowledges the tug between protecting our planet and our busy modern lives.

She completed the North Inner City Dublin GP Scheme in 2015. She practised in Dublin city before moving to Canada where she worked as a Family Physician in a rural practice. She returned to work full time as a GP in Drumshanbo 2020 where she is now a Partner. She has a special interest in Lifestyle Medicine, medicine optimisation and is passionate about practising and promoting sustainable healthcare. *"The biggest aim of our toolkit is to make sustainable general practice the best and easiest option for GPs."*

Dr Andrée Rochfort

Dr Andrée Rochfort is a GP in practice in County Wexford and is Director of Quality Improvement and the Doctors Health Program with ICGP. She is President of EQuiP, the European Society for Quality & Safety in General Practice/Family Medicine, which is a Network organisation of WONCA Europe. She is a Board member of the European Lifestyle Medicine organisation. She has a master's degree in medical education and qualifications in occupational medicine and lifestyle medicine. She has published articles and book chapters and is an experienced international speaker with keynotes, symposia, workshops, and lectures in Europe, Canada and Australia.

Andrée has a special interest in improving healthcare quality, including wise use of finite healthcare resources and human factors such as personal health and wellbeing for general practitioners and their practice teams. There is a growing international movement of healthcare professionals concerned about our planet's health and this led Andrée to advocate for a Working Group in ICGP. The co-benefits of improving human health and planetary health while working with patients and policy makers for healthier lifestyle choices, behaviour change and other actions is now established in medicine.

Dr John Allman

Dr John Allman is a full time GP in north Dublin. He graduated from Trinity College Dublin in 1996 and later worked as a GP Partner in the UK until 2010. He has been a GP Trainer over the past decade. He has been co-chair of the Primary Care Sustainability Group in IDE (Irish Doctors for the Environment).

Johnny is a passionate advocate of preventive medicine and the use of lifestyle approaches for both health and disease. He has successfully completed the BSLM Diploma in Lifestyle Medicine (2019) and University of Winchester certificate in plant-based nutrition (2020). He feels there is an imperative for doctors to embrace this planetary crisis because there will be no healthy populations sustained on a sick and poisoned planet. This GLAS toolkit provides the direction and tools to help mend our ways.

Dr John Cox

Dr John Cox graduated from University College Dublin in 1979, completed his general practice training in 1983 and worked in general practice in South Dublin and as a Research Registar at the Blood Pressure Unit, Beaumont Hospital, from 1985 to 1992. Since then, he has been in general practice at Fethard-on-Sea, Co. Wexford. He became a Fellow of the Royal College of Physicians of Ireland (RCPI) and a Fellow of the Royal College of General Practitioners (RCGP) in 1994. He is immediate past Chairman of the Board of the Irish College of General Practitioners (ICGP) and past Chairman and Provost of the RCGP Republic of Ireland Faculty. He presently sits on the Council of the ICGP and is Secretary of the ICGP Wexford Faculty. He is co-author of the ICGP publication 'Cardiovascular Disease: Prevention in General Practice'. He was previously a Director of the Irish Heart Foundation. He is a long-standing member of the British and Irish Hypertension Society. He was a GP trainer with the HSE for many years and is interested in curriculum development in general practice. His professional interests are in risk factor assessment and management of cardiovascular disease and the use of information technology in general practice. John is delighted to be a member of the ICGP Sustainability Working Group and has been actively involved in the production of the GLAS Toolkit.

Dr Oisín Brady Bates

Dr Oisín Brady Bates MB BAO BCh MSc. is a medical doctor currently on the Trinity College Dublin General Practice Specialist Training Scheme. He graduated with an honours medical degree from NUIG in 2018. He is a trainee representative on the Irish College of General Practitioners sustainability working group and the global health working group. He is the European Young Family Doctors Movement planetary health special interest group lead and an active member of Irish Doctors for the Environment.

The ICGP Sustainability Working Group wish to acknowledge the support and input of the ICGP in the production and publication of this toolkit. We would like to pay particular thanks to Barbara O'Neill, Patricia Patton, Emma Smith, Aileen O'Meara and Gillian Doran for their keen eye and patience in checking the grammar, references, style and final design. Their efforts, competing with various other college related projects, allowed publication on Earth Day April 22nd within a limited timeframe. The many after hour emails were noted and we are extremely grateful for their ongoing support.

Moreover, the ICGP has demonstrated leadership in being one of the first health colleges in the world to recognise the climate crisis and to implement measures to incorporate planetary health into its activities and actions. A particular thank you to the board, CEO Fintan Foy and especially COO Prof Claire Collins and Medical Director Dr Diarmuid Quinlan for also reading and approving this document. This toolkit represents their ongoing support to rural and urban communities now and in the future.

Executive Summary

"If the global healthcare sector was a Country, it is estimated that it would be the fifth largest global emitter of carbon." [1]

Planetary health refers to "the health of human civilization and the state of the natural systems on which it depends." [2]

"Planetary health is a solutions-oriented, transdisciplinary field and social movement focused on analysing and addressing the impacts of human disruptions to Earth's natural systems on human health and all life on Earth." [3]

"As family doctors we are in a unique position to promote knowledge about planetary health and behaviour changes, which can improve both individual health and planetary health - the so-called co-benefits - such as active transportation, low emission sources of energy and a more vegetable based diet in our patient communities. It is also imperative that planetary health be included in the core curriculum of medical schools, family medicine residencies and further professional development. We must strive to integrate sustainability into our individual behaviour, clinical practice, and in our meetings...

...we invite all family doctors to collaborate in the development of innovative strategies, practical examples, scientific evidence for effective action, inclusive educational resources and to advocate for planetary health."

Endorsed by WONCA Executive October 2016 [4]

"The aim of the Irish College of General Practitioners Sustainability Working Group is to raise awareness among general practitioners of the need to consider the environment and the future sustainability of healthcare delivery to our patients today."

Terms of Reference ICGP Sustainability Working Group 2020

Developing this 'Glas toolkit' for sustainable practice-based actions and activities tailored to Irish general practice has been a major objective of the ICGP Sustainability Working Group. The optional practical tools described in this toolkit aim to minimise the environmental impact of clinical interventions and improve efficiencies of the business of running a practice in terms of practice time, economy, patient engagement with local services, supports and resources.

All healthcare professionals, globally, have a role to play in planetary health, including in primary care. The healthcare sector must be sustainable into the future, so that it continues to have capacity to respond to healthcare needs, and to promote and maintain the health of people and the planet.

However, the experts on climate change, health economics and on the capacity of the healthcare workforce are telling us the evidence is overwhelming that we must act now to protect health services and the health sector generally. [5]

So, it is imperative for all to act now to (a) increase self-awareness and the knowledge of colleagues that the healthcare activities each healthcare worker participates in contributes to the carbon footprint during the delivery of healthcare, and (b) to act to mitigate this in one's own clinical practice and (c) to work with colleagues and with other stakeholders in healthcare organisations, public health, policy makers and governments to reduce the impact of humans and healthcare related activities on planetary ecosystems.

Irish general practice is ideally placed to demonstrate leadership within the medical profession (22,000 registered medical practitioners) among healthcare workers (100,000 healthcare workers) and in partnership with the general population (4.6 million 2016 Census).

This First Edition of the ICGP Glas Toolkit (2022) presents a range of possible solutions that you as a health professional may choose to implement in your clinical practice. This may involve making

simple or complex changes to your clinical decision making, clinical behaviours and actions, your consultation style, the timing of actions on clinical interventions and referral for tests or procedures.

The ICGP Infographic included with this Glas Toolkit illustrates the categories of our clinical practice that we can consider addressing to make a positive impact on planetary health.

Irish general practices can also educate and inform our practice populations, and advocate through the appropriate pathways for the health service, for patients, and for the environment we all share.

This Glas Toolkit contains evidence-based information on the activities that GPs and the practice team can undertake to improve the sustainability of their activities in the practice. It also includes ideas and templates for clinical audits and quality improvement projects. You have an option to apply online for the Glas Certificate of Enrolment and posters for displaying at your practice.

The toolkit may inform your prescribing patterns and preferences, or whether you prescribe at a particular point in time. It also includes guidance on rational prescribing and disposal of inhalers, antibiotics, and medication reviews.

It includes a concise section on rational investigation, testing and self-management; all these topics are part of a rapidly growing body of medical research and literature internationally. References and evidence which can help you reach a clinical decision are included. The authors are aware that clinical information will need to be updated regularly in this evolving medical subspecialties for example for health screening, over-diagnosis, over testing, with appropriate patient education on all of these topics as part of quaternary prevention.

It may help you to increase engagement of patients with local community support for their physical and mental health (social prescribing). It may also involve changes to how you approach patient education with a mindset focused on how clinicians and patients can work together to make a positive impact on the planet's resources.

All planetary health related actions have the potential to improve the carbon footprint of clinician-led general practice activities and the carbon footprint of GP patients through for example active transport (self-propelled transport like walking and cycling without using fossil fuels), weight reduction, increasing dietary intake of plant-based foods e.g. wholegrains and legumes, and smoking cessation.

Prevention and reversal of medical conditions such as obesity, hypertension, hyperlipidaemia, anxiety and depression through evidence-based lifestyle changes and incorporating wellbeing activities into patients' lives takes effort, time and needs a multidisciplinary team approach and educational resources. Group activities for patients can strengthen communities.

Social determinants of health affect the ability of vulnerable populations to respond to the challenges of climate change. Healthcare workers who work in general practice have insights into patients' lives and localities, and are trusted and connected within the communities they work in. They can advocate for policies that address these determinants of health such as health literacy, housing, education, green and blue spaces, active transport, public transport, and the economy.

Recent changes in Irish general practice such as the structured "Chronic Disease Management" Programme address peoples' long-term conditions through lifestyle changes, self-management plans and active management of prescribing and referral to community supports and hospital services. For some patients, these interventions are paid for through state contracts.

Many activities in general practice that help protect planetary health will not attract a specific fee. Some will involve a reduction in costs. Thus, lowering of energy costs, pharmaco-economics, and reduced wasteful practices in healthcare such as appropriate medication management, de-prescribing or unnecessary use of paper or single use items all save money. Some of the actions you take can be performed as part of an annual practice clinical audit for competence assurance purposes.

Supporting patients to live healthier lives is at the core of continuity of care for patients and is a core element of job satisfaction of family doctors.

"Small changes on a large scale in general practice can make a difference."

ICGP Sustainability Working Group 2022

* The Gaelic word "Glas" means green and is commonly found in placenames in reference to grass or grassy slopes.

Disclaimer:

The information in this Glas Toolkit is correct at the time of publication. Clinicians are advised to ensure they have up to date clinical information, evidence, and guidelines for their individual clinical decisions.

Introduction

The Lancet has described the climate crisis as "*the biggest global health threat of the 21st century.*"[6] Climate change has also been described as the greatest risk to the stability of the global economy by the World Economic Forum.[7] The Intergovernmental Panel on Climate Change (IPCC) has warned that limiting global warming to 1.5°C (above pre-industrial levels) is crucial.[8] The UN Secretary-General António Guterres has described the 2021 IPCC report as a "code red for humanity."[9] The World Health Organisation (WHO) predicts approximately 250,000 extra deaths from climate change per year globally from 2030, and that the direct cost impact will be $2-4 billion per year over the next decade. [10]

Ireland has a legally binding commitment to reduce total carbon emissions by 51% by 2030.[11] This represents a colossal challenge for all sectors in our society and healthcare is no different in this respect. If global healthcare were a Country, it is estimated that it would be one of the top 5 in the world with respect to emissions.[1]

Figure 2. From Health Care's Climate Footprint - How the health sector contributes to the global climate crisis and opportunities for action. [1]

What is Planetary Health?

Planetary Health can be defined as "*the health of human civilization and the state of the natural systems on which it depends.*" [2] What then is the link between our everyday work and the climate crisis? As family doctors, on the front lines of protecting health, it is important that we are aware and act accordingly upon the interplay between the climate crisis and emerging health impacts.[12]

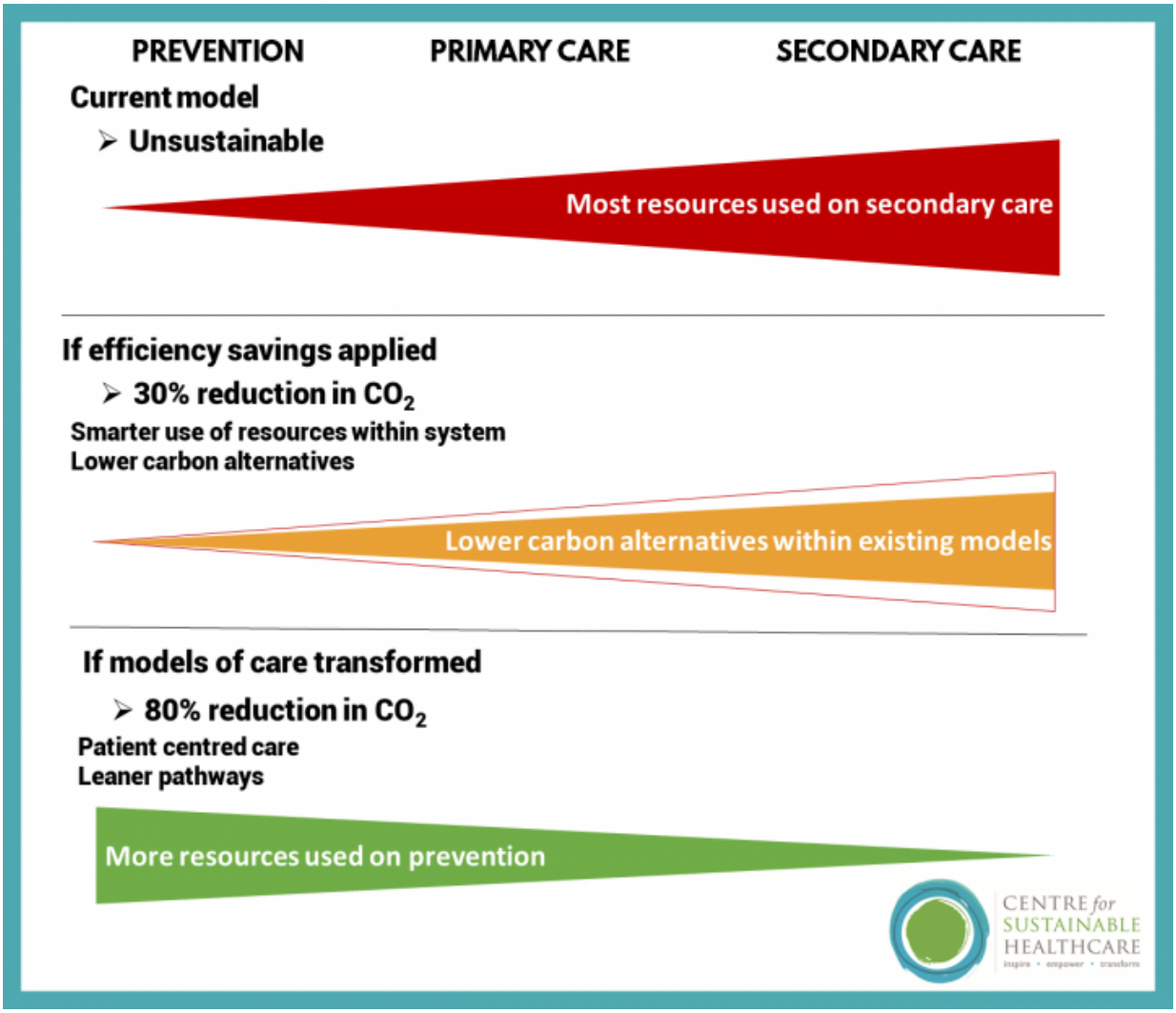

Figure 3. Preventing disease is the key to reducing carbon emissions and the use of valuable resources (Centre of Sustainable Healthcare). [13]

Unhealthy lifestyle behaviours such as smoking, excess alcohol, sedentary lifestyles and poorly balanced nutrition leads to illnesses, and in particular chronic illness such as cancers, obesity, diabetes, hypertension, and cardiovascular emergencies such as strokes and heart attacks.[14] People with concurrent illnesses - multimorbidity – and their related outcomes make up the bulk of appointments and workload in general practices today.[15]

A key component of planetary health is the concept of preventing disease as opposed to chronic disease management which is resource intensive (investigations and therapeutic interventions). Therefore, we might reconsider Planetary Health as Preventative Health.[16]

What is our role as GPs?

With an understanding of **planetary health** as **preventative health**, GPs should feel much more at home and start to understand the significance of their role within the community. Doctors and nurses are routinely rated as the most trusted sources of information in society.[17] The 2019 WONCA declaration on Planetary Health called on family doctors across the world to act and lead on planetary health and this declaration has been formally recognized by the ICGP.[12-18] At the time of this declaration Ireland became one of the first countries to declare a climate emergency and since then Ireland has signed into law the 2030 commitment to reduce national carbon emissions by 51%.[11] [19] Therefore the need for action is time dependent.[20]

A qualitative descriptive study by working group member Dr Oisin Brady Bates and colleagues sought to investigate the barriers and facilitators influencing the integration of planetary health into undergraduate medical education at an Irish university. The study found a demand from medical educators for the integration of planetary health topics into the medical curriculum. [21] Going forward inclusion of planetary health will need to be a central theme of medical education both undergraduate and postgraduate, and across all disciplines.[22]

This toolkit is a construct that individual practices may find useful to begin a journey towards a greener more sustainable future. Many of the actionable points are triple wins i.e., good for patients, the planet, and the pocket. **Your practice is very likely already doing some of the suggested actions.**

The intention of this toolkit is to make the transition to sustainable quality healthcare as easy as possible. It is more beneficial for many practices to do a little than a few to do it perfectly. **As the WHO's Mike Ryan aptly stated "Perfection is the enemy of the good when it comes to emergency management. Speed trumps perfection."** Sustainability is a journey rather than a destination and even taking the time to consider engaging with this toolkit is a cognitive step that may well be transformative for you and your practice. There are suggested audits throughout the toolkit for your convenience which might help map out this journey and allow you to share and celebrate your successes as you go along.

How To Use This Toolkit

The graphic from the NHS Sustainability Development Unit shown in Figure 4, illustrates just where the emissions are found in healthcare. You will see that prescribing in primary care is where the majority of emissions are found. Therefore, this toolkit is aimed at addressing the major carbon hot spots in our everyday activities and actions and highlights ways to prevent chronic disease upstream from the hospital bed or pharmacy. Like the ICGP Planetary Health infographic shown in Figure 1, the main area to focus on is within the consultation. Secondary to that are actions outside of the consultation, such as tele-consultations and e-prescribing. We advise that you start off by signing up to the Glas Toolkit as a practice and then choosing an area to work on as a team. Audit and Quality Improvement projects are a terrific way to actualise green ideas into meaningful action. They also help show other practices what is possible. There are some examples in each section to give you ideas.

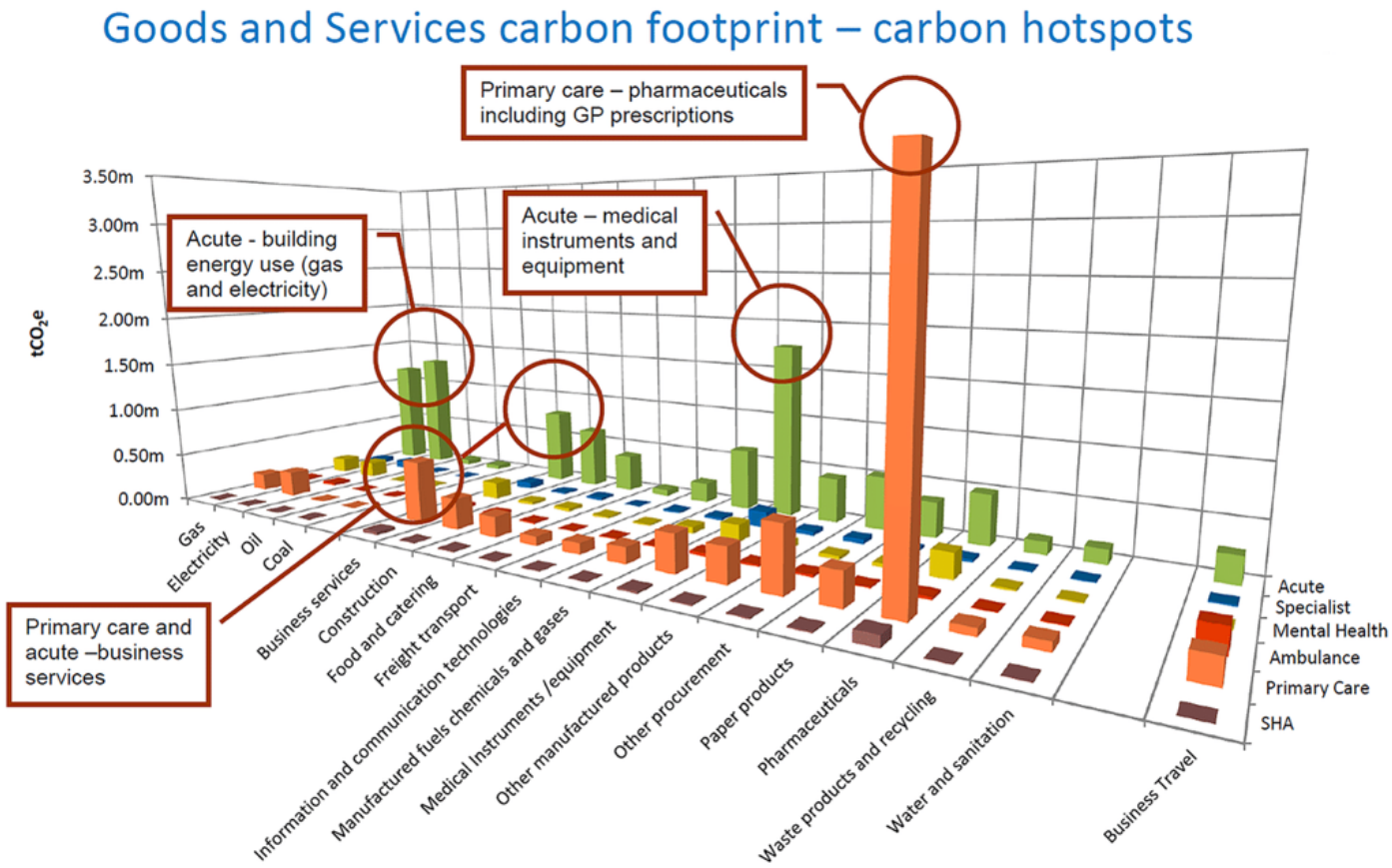

Figure 4. Goods and services carbon hotspots by healthcare sector. Source: Goods and services carbon hotspots. NHS Sustainable Development Unit 2012. [23]

Get Started!

"The journey of a thousand miles begins with one step." Lao Tzu, 6th century BC.

Enrol with GLAS to start your journey.

Please enter your details in the application form below and copy into an email to info@icgp.ie to request your Glas certificate of enrolment.

Contact person

Practice Name

Email Address

Eircode

Are you urban or rural?

No of Patients

No of Employees

Your data will be kept confidential

Start with a first exploratory practice meeting to introduce the Glas Toolkit to all staff members. *(Creating buy-in and enthusiasm are essential for success).*

Elect an overall leader /team and/or a lead for each separate task. *(Accountability and continuity are what is needed to drive and sustain change, choose your champion(s)).*

Agree to regularly discuss progress, setbacks, and successes at practice meetings. (*Set a time limit, keep it short and keep it positive!)*

Request your Glas certificate of enrolment, educational posters or PDFs and other resources from ICGP.

Similar to a Corporate Responsibility Strategy, will your practice provide and endorse a statement on commitment to sustainable healthcare?

See Sustainability and Planetary Health on www.icgp.ie for a draft statement for your waiting room and website.

The practice commits to an audit or QI project that improves the sustainability of the practice.

One staff member partakes in an online climate course.

- https://online-learning.harvard.edu/subject/climate-change
- https://sustainablehealthcare.org.uk/courses/introduction-sustainable-healthcare (fee charged)
- https://online.sgu.edu/climate/
- WONCA primary care module

PRESCRIBING: INHALERS

Prescribing accounts for an estimated 65% to 90% of the carbon footprint of General Practice.[24] Globally, the pharmaceutical industry carbon emissions are more than 50% higher than the automotive sector.[25] Almost 3.5% of the entire NHS emissions can be attributed to inhalers alone.[26] Considering this includes the heating and powering of all hospitals, buildings, transport and procurement, the carbon footprint of inhalers is disproportionately large. **In fact, 20-25% of all primary care emissions are attributable to inhalers.**[23] The only current estimate for the total carbon footprint of Irish healthcare was generated by Health Care Without Harm, who estimated the sector emitted 2.83 megatons C02 (MtCO2) in 2019.[1] **The component that related to inhalers was estimated at 53.6 ktCO2, or 1.9% of total Irish healthcare emissions** (based on the estimate by the Environmental Protection Agency (EPA) National Inventory Report).[27] Prescribing and prescribing inhalers in particular are a great place to start to improve the sustainability of your practice.

A significant rethink around inhaler prescribing can not only improve clinical outcomes but is also the most important and accessible step for your practice to significantly reduce your emissions

Respiratory disease and a warming world

Globally, 91% of the world's population live without quality air, with COPD rated as the 3rd most common cause of death globally.[28] [29] In Ireland, it is estimated that 500,000 people are living with COPD yet only 200,000 are diagnosed.[30] Ireland has the highest rate of hospital admission with COPD of any country in the OECD.[31] There are currently about 380,000 people with asthma in Ireland, which has the 4th highest prevalence of asthma in the world and the majority of cases are sub optimally controlled.[32] [33] Increasing global temperatures are likely to further promote outdoor air pollution, pollen exposure, and extreme weather events. Besides worsening respiratory health, air pollution promotes atopy and susceptibility to infections.[34] **Management of chronic respiratory disease is by far the most impactful place to start when greening your practice.**

CFCs vs HFCs

The Montreal Protocol of 1987 banned ozone depleting CFCs (chlorofluorocarbons) which had been used in inhaler devices.[35] **They were replaced with HFCs (hydrofluorocarbons) which do not damage the ozone, however they have a disproportionate global warming potential at 1000-3000 times that of CO2**.[36] The main driver of emissions from inhalers are the HFCs from the Metered-Dose or 'spray' inhalers (MDIs), as opposed to the dry powder inhalers (DPIs) or soft mist inhalers (SMIs) which do not contain propellant. Ireland's most commonly prescribed inhaler is by far the 'blue one' ie Ventolin Evohaler (MDI); each inhaler equates up to 28kg of carbon, which is the equivalent of driving from Tralee to Dublin (174 miles).[36] Alternatively, salbutamol or budesonide DPIs, have a carbon footprint of less than 1kg CO2 per inhaler, the equivalent of driving 4 miles.[37]

A 2023 study by working group members Dr Sean Owens and John Allman found that 4,427,287 inhalers were dispensed in Ireland in 2019, of which 2,608,433 (59%) were MDIs and 1,818,854 were DPIs/SMIs (41.1%).[38] The total carbon equivalent of these inhalers was estimated to be 54,765 tCO2. **MDIs account for 59% of inhaler units dispensed but account for 97% of inhaler-related carbon emissions.** They concluded that the targeting of inhaler prescribing offered the potential to significantly improve the carbon footprint of Irish healthcare.

How to make changes

There are opportunities to improve patient care and environmental footprint at every stage of the lifecycle of respiratory disease; from prevention, diagnosis, and treatment all the way to disposal of used appliances.

Getting the diagnosis right

Asthma can be both over diagnosed and underdiagnosed in the community.[39] Careful history taking and investigations such as spirometry improve diagnostic accuracy. The ICGP Quick Reference Guide for Asthma recommends regular reviews to assess diagnosis and response to treatment.[40]

A non-pharmacological approach to asthma

Smoking: Smoke exposure in people with asthma reduces control, reduces response to steroids and increases the risk of hospitalisations.[41] Making Every Contact Count (MECC) by consistently asking about smoking cessation and child smoke exposure, has been shown to modify behaviour at a population level.[42-43]

https://www2.hse.ie/quit-smoking/

Exercise: There is significant evidence that aerobic activity can improve asthma symptom control and lung function.[44] It is important to ask and advise about exercise under the MECC framework. For children with asthma swimming may be particularly useful.[45]

Click on the link below to Moving Medicine, which provides advice on how to speak to your patients about exercise.

https://movingmedicine.ac.uk/consultation-guides/condition/child/asthma-paeds/

There is also evidence to suggest that weight loss in patients living with obesity improves asthma control. Surgically induced weight loss has been shown to result in significant improvements in asthma severity, use of asthma medication, dyspnoea, exercise tolerance, and acute exacerbations, including hospitalizations due to asthma.[46]

Routinely asking and advising on smoking cessation, simple exercise, advocating for active transport, avoiding pollution where possible and referring for pulmonary rehabilitation are all steps as important as which inhaler to prescribe.

Switch inhalers to DPI where appropriate

Inhalers vary between MDIs, which use HFCs as a propellant, soft mist inhalers (SMIs) which use water as a propellant and DPIs, which do not have a propellant. DPIs and SMIs are therefore exponentially more environmentally friendly. DPIs are suitable for most people, bar the very young, the very old and those with disabilities who may not have sufficient inspiratory flow rate. Where there is no DPI alternative, there may be a much more sustainable MDI e.g., a low volume salbutamol MDI (which has half the carbon footprint of a standard volume salbutamol MDI).[36] Evidence suggests that many patients are unable to use their inhalers effectively.[47 48] Inhaler device has also been shown to influence compliance for long-term use.[49] Although study results vary, estimates of inhaler errors include up to 90% of patients using MDIs compared to up to 54% of patients using DPIs.[50]

The 2019 GINA report gives clinical reasons for moving away from short-acting beta agonists (SABA) monotherapy in asthma, which it described as "the most important change in asthma management in 30 years."[50] GINA no longer recommends treatment with SABA alone without inhaled corticosteroids (ICS) and recommends that all adults and adolescents with asthma should always receive ICS in their formulation, be it symptom-driven or daily use, i.e., maintenance and reliever therapy (MART).[51] Indeed the Asthma Society is campaigning to address the significant issue of SABA overuse as it is directly correlated with patient harm (www.asthma.ie).[52]

MDIs (multidose/spray inhalers)	DPIs or SMIs (powder or mist inhalers)
Do not have dose counters, leads to waste and poor compliance	Usually have dose counters, prevents waste, and aids compliance
Must use a spacer for effective delivery, infrequent use in practice	Good drug delivery, a range of devices available
The most common MDIs are SABAs, of which overuse is a cause of harm	SABAs are available in DPI form and easy to use e.g. Ventolin Diskus or Bricanyl Turbohaler *(most doctors are asking about the practical switch options)*
GINA advised combination LABA/ICS for asthma flares, which needs x 2 MDI devices	DPIs have combination ICS/LABA devices for Maintenance and Reliever Therapy (MART)
MDI carbon emissions are up to x 3000 CO2	DPI/SMI emissions are similar to other medications

Table 1. Inhaler prescribing - multidose or spray inhalers (MDIs) versus dry powder inhalers (DPIs) or soft mist inhalers (SMIs).

Follow-up and repeat prescribing

- NICE, SIGN and ICGP guidance acknowledges that poor inhaler technique is a possible reason for suboptimal asthma control and advises that inhaler technique, including spacer technique for MDIs, should be observed and checked at every consultation.[53-54-55]
- We should assess, review and adjust response regularly with step up and step down as per GINA/ICGP guidance.[40-50-55]
- Other patient-specific factors to remember are preference for dosing regimen, suitability for using a spacer when not at home, ergonomics (e.g., for arthritis) and cost.
- Exercise, smoking cessation and even modest weight loss can aid symptom control and should also remain a part of the follow-up consultation.

Disposal of inhalers

- NHS data suggests most inhalers are disposed of with a sizeable proportion of doses remaining, hence using MDI, SMI or DPIs with counters can prevent such waste.[56]
- The most of all inhalers end up in landfill. Aside from the plastic issue, HFCs gases leach out for years contributing to global warming.
- Some pharmacies will recycle used inhalers. TEVA has a pilot recycling scheme with participating pharmacies distributed throughout Ireland.
- The *Respimat* device has reusable cartridges which further improves its carbon footprint.[57]

SUGGESTED ACTIONS: Inhalers

1. Please see this excellent pocket **toolkit** to become a green inhaler prescriber, courtesy of our colleagues at Irish Doctors for the Environment (IDE). https://ide.ie/resources/healthcare-sustainability/

2. Have a practice policy that key points are checked at every review (note CDM is an ideal time to discuss these points):

   a. Promote primary prevention (smoking, exercise, weight loss etc.)

   b. Check spacer use and inhaler technique.

   c. Promote adherence. The carbon footprint of any inhaler is superior to an incorrectly used one that can lead to unnecessary admissions. Compliance is closely correlated to morbidity and mortality.

   d. Identify, flag and action over-prescribing, especially SABA overuse.

3. Have a practice meeting with prescribers educating on why to consider the switch from MDIs to DPIs or SMIs, or low volume MDIs.

4. Consider auditing your inhaler prescribing- Click for link to a sample audit. Audit on switch after 6 months, how much carbon has your practice saved? How many SABA inhalers are prescribed without ICS?

5. Advertise the importance of correct medication disposal in your practice during consultation and/or via posters/practice websites. A prescription for inhalers to include a friendly reminder to return empty inhalers to your local pharmacy where available.

6. Form links with your local pharmacy, can they get involved with the TEVA recycling scheme or take back used inhalers and other medications?

PRESCRIBING: MEDICINE OPTIMISATION

Greener NHS estimates that prescribing accounts for 22% of the total NHS carbon footprint and between 65 and 90 % of the carbon footprint of General Practice (Figure 5).[58]

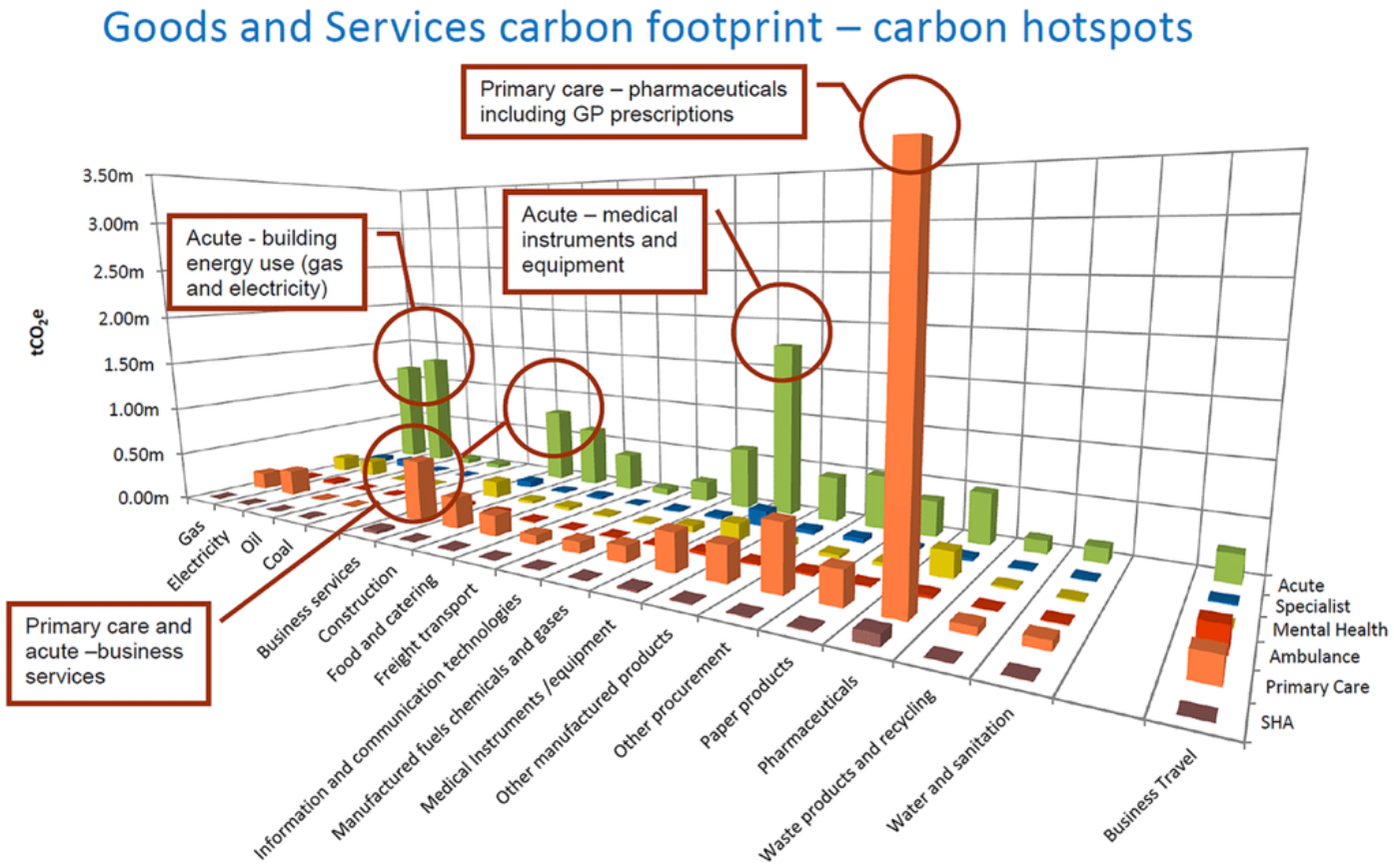

Figure 5. Goods and services carbon hotspots by healthcare sector. Source: Goods and services carbon hotspots. NHS Sustainable Development Unit 2012.[22]

The NHS recently published a report which estimated that overprescribing accounts for approximately 10% of total prescribing.[59]

The WHO, *Medication Without Harm* aims to half medication-related harm globally over the next five years.[60]

It is estimated that half of all medicines are not taken appropriately, costing the EU 1.25 billion annually.[61]

As a profession we are routinely informed of the safety implications of polypharmacy, however there is also a less well-known environmental cost; pharmaceutical ingredients have been found in the soil, in our water supply and our food chain where they can have a negative impact on living organisms.[62-63]

- The carbon footprint of each prescription item has been modelled at 5kgCo2.[24]
- This is the equivalent of driving 28km in a regular sized car or charging 608 smart phones.[64]
- Data from the Primary Care Reimbursement Service (PCRS) suggests about 20% of ≥ 65-year-olds are prescribed ≥ 10 repeat medicines.[65]

Furthermore, polypharmacy is associated with inappropriate prescriptions and adverse drug events (ADEs). Older community-dwelling people in an Irish setting, prescribed more than two potentially inappropriate prescriptions (PIP) are more likely to report ADEs, poorer health related quality of life and attend the Emergency Department over a 2-year follow-up.[66]

It is estimated that about 10% of preventable hospital admissions in the elderly are the result of drug related morbidity.[67] This amounts to a significant health, financial and waste burden.

A systematic review identified non-steroidal anti-inflammatory drugs, anticoagulants, antiplatelets and diuretics as the four drug groups which are most commonly associated with preventable drug related morbidity.[68]

Optimising our prescribing has the potential to greatly improve patient care and adherence.[69]

The ICGP has published a Quick Reference Guide to enable practices to carry out a medication review:

Click here to view this guide online

The "Polypharmacy Guidance Realistic Prescribing" document provides a framework upon which you may choose to start your medicine optimisation based on 7 questions as follows: https://www.therapeutics.scot.nhs.uk/wp-content/uploads/2018/04/Polypharmacy-Guidance-2018.pdf

1. What matters most to you? (the patient)

2. Identify essential therapy.

3. Identify unnecessary therapy.

4. Are therapeutics objectives being achieved?

5. Is the patient at risk of ADRs or suffering from ADRs?

6. Is drug therapy cost effective?

7. Is the patient willing and able to take drug therapy as intended?

* NB much of this can be and is already being done as part of the CDM review

SUGGESTED ACTIONS: Prescribing

1. The practice performs a medication review on all polypharmacy prescriptions. Inclusion criteria could vary from patients being prescribed anywhere from 7 to 10 medications. The ICGP has QRG on medication review and sample audits. Linking in with your local pharmacy team is a great way of identifying over-prescribing, poor compliance and building rapport with the community health team. https://www.icgp.ie/go/in_the_practice/quick_reference_guides/quick_reference_guides_qrg_/repeat_prescribing

2. The practice has the home page of Medicines Management Program (HSE/medicines management programme) preferred generics on web browsers for ease of reference. https://www.hse.ie/eng/about/who/cspd/ncps/medicines-management/preferred-drugs/

3. The practice conducts a baseline audit for at least one preferred generic e.g. PPI, statin, ACE-i etc.

4. Safe disposal of medications should be discussed with patients and unused medications should be returned to the pharmacy for proper disposal.

Useful resources include:

- https://www.hpra.ie/homepage/medicines for SPC of medications.
- The HSE Medicines Management Programme (MMP) has a several of useful resources on their website aimed to promote safe, effective and cost-effective prescribing. (https://www.hse.ie/eng/about/who/cspd/ncps/medicines-management)
- The STOPP START screening tool is well established and can guide us through deprescribing in the elderly; STOPP/START criteria for potentially inappropriate prescribing in older people. https://www.cgakit.com/m-2-stopp-start
- Medication Without Harm – The WHO's campaign to reduce medication-related harm by improving practices and reducing medication errors (https://www.who.int/initiatives/medication-without-harm).
- Polypharmacy Guidance Realistic Prescribing is a useful 7 step review plan, published by the Scottish Government's Polypharmacy Model of Care Group 2018 (https://www.therapeutics.scot.nhs.uk/wp-content/uploads/2018/04/Polypharmacy-Guidance-2018.pdf)
- The European Union iSIMPATHY (Implementing Stimulating Innovation in the Management of Polypharmacy and Adherence Through the Years) project (https://www.isimpathy.eu/). iSIMPATHY is a 3-year EU funded project (2019 – 2022) operating in Northern Ireland, Scotland and the border areas of the Republic of Ireland that will, through medicine reviews, ensure the optimal and sustainable use of medications for those with multiple morbidity.

ANTIBIOTIC USE

"Antimicrobial Resistance (AMR) is one of the greatest challenges of our time and we cannot leave it for our children to solve:" Dr Tedros Adhanom Ghebreyesus (WHO Director-General November 2020).[70]

AMR is a leading cause of death around the world, with the highest burdens in low-resource settings. Antibiotic Resistance has been described as a "one health" problem meaning the health of humans, animals and the environment are all linked.[71] All three sectors must work together, therefore the solutions to AMR must also be holistic. Transmission of resistance from animals to humans can take place through a variety of routes, the importance of the food-borne route is difficult to quantify though probably important.[72] Infographic demonstrating link between human, animal and environmental health in Ireland: Click here to view.

The European Centre for Disease Control and Prevention 2020 report ranked Ireland 8th highest out of 29 countries for consumption of antibacterials for systemic use in the community.[73] In a recent WHO report on antimicrobial resistance the cost of AMR to the economy is expressed as significant. In addition to death and disability, prolonged illness results in longer hospital stays, the need for more expensive medicines and financial challenges for those impacted.[74]

Most human antimicrobial use in Ireland is in the community (90%), meaning how we chose to prescribe in primary care can have a significant impact on the progression of AMR.[75] For example, a report on antimicrobial use in HSE Older Persons Residential Care Facilities revealed that total antimicrobial use was higher in Ireland than the European average (Irish 9.8% versus European average prevalence of 4.9%).[76] Antimicrobial use for prophylaxis of infection in HSE Residential Care Facilities was also higher than the previously measured European average, accounting for 50% of total antimicrobial use, with 6.3% of all residents being on prophylactic therapy. (European average prevalence 29% of total antimicrobial use, with approximately 1.5% of residents on prophylaxis).[75]

Therefore, community and residential care are the most rational areas to focus on. Finally, patients are usually happy to take our advice regarding antibiotics. A Healthy Ireland Survey from 2017 demonstrated positive attitudes of the Irish population towards antibiotic prescribing. Click to read.

Suggested actions: Antibiotics

1. Agree a practice policy on using antibioticprescribing.ie to check all antimicrobial prescriptions.
2. Adherence to antibiotic guidelines is an easy audit to do, see example. Click for template
3. Ask and involve your local Out of Hours service to get involved, this is where some patients may go to attain antibiotics for self-limiting viral infections and a good way to ensure there is quality care for your patients and your community irrespective of when they present.
4. Ireland has a higher use than the European average for prophylactic antibiotic use.[74] These prescriptions are easy to find and amend as appropriate. Click for sample audit on UTI prophylaxis
5. The practice has posters/postings on their website regarding the correct use of antibiotics. See www.healthpromotion.ie or your local HSE CHO liaison for resources.

Overdiagnosis does not improve prognosis and may lead to patient harm through unnecessary interventions, side effects and worry.[77] There is also a societal impact with the use of finite health resources, as well as the profound environmental impact (emissions, water use, pollution) of overuse of pharmaceuticals.[78]

The key to reducing unnecessary tests, investigations, procedures, and treatments is not only to correctly diagnose and use evidence-based guidelines for treatment, but also to meet the ideas, concerns and expectations of the patient. The fulcrum of how to meet patient needs and expectations is through a well-structured consultation.[79]

For example, taking the time to set the consultation agenda can ensure an added request at the end of a consultation, such as a request for a lumbar MRI for persistent back pain, is given adequate time in a separate consultation. It may be the patient has no red flags, the pain is under 3 weeks in duration and some reassurance and lifestyle advice is all that is needed. Picking up on cues, hidden agendas, pursuing concerns and having time to adequately explain management plans are all key aspects of the consultation that may mitigate unnecessary use of resources.

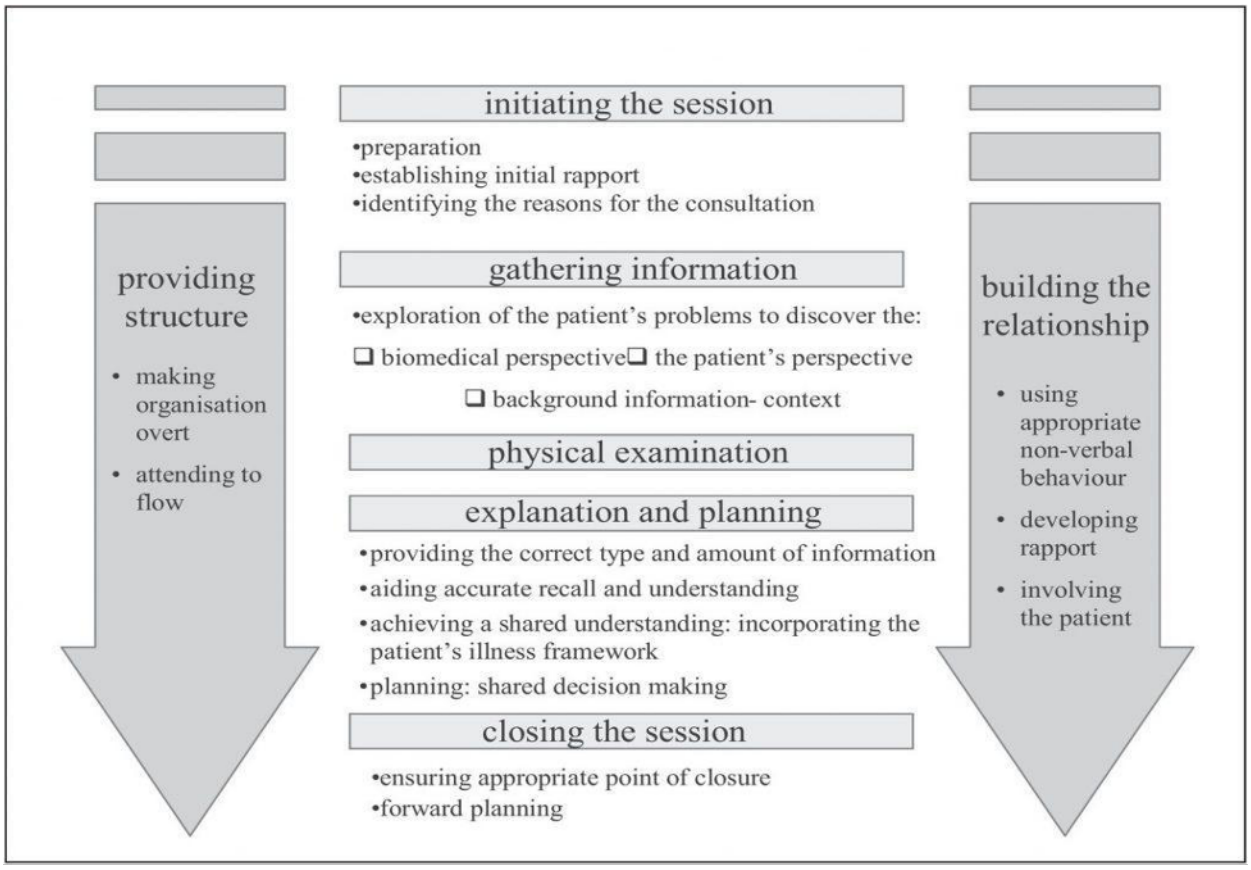

Figure 6. The Calgary-Cambridge consultation model.[79]

Screening Tests

There are a variety of unintended consequences of the screening tests that lack an evidence base e.g.,

- overdiagnosis
- false positives
- misdiagnosis
- anxiety
- side effects from treatments (pain, bleeding, infection)

While some of the above risks of screening can be low, they are difficult to justify when resources are limited, the benefits questionable and the potential risks occurring in a previously well person. Screening tests often fulfil Tudor Hart's inverse care law which states those who are most in need of healthcare are the least likely to receive them.[80] Examples of screening tests that lack a robust evidence base include general health checks, brain scans looking for aneurysms without any risk or PSA testing without a relevant history taking and prostate exam.

See the WONCA Europe Position Paper on Overdiagnosis:[81]

https://www.woncaeurope.org/kb/overdiagnosis-and-action-to-be-taken-–-position-paper-2018

Also see **Cochrane Systematic Review on health checks:**[82]

https://www.cochrane.org/CD009009/EPOC_general-health-checks-reducing-illness-and-mortality

"Health checks had little or no effect on the risk of death from any cause (high certainty evidence), or on the risk of death from cancer (high certainty evidence), and probably had little or no effect on the risk of death from cardiovascular causes (moderate certainty evidence). Likewise, health checks had little or no effect on heart disease (high certainty evidence) and probably had little or no effect on stroke (moderate certainty evidence)."

SUGGESTED ACTIONS: Referrals and Investigations

1. A Choosing Wisely champion is named in the practice to keep abreast of updates from the evolving world of Too Much Medicine.[83]

2. Patients with chronic health conditions are informed of the HSE self-management programme. Click here. Again, CDM is an ideal opportunity for this. https://www.hse.ie/eng/health/hl/selfmanagement/

3. Consider a practice policy on advance care directives for those near the end-of-life e.g., advanced care directives, enduring power of attorney, liaising with community palliative care to ensure rational prescribing for end of life medications.

4. Agree a policy on blood tests e.g., frequency of screening bloods (see Table 2). Focusing on a particular test might make this easier to start e.g., lipids every three years for primary prevention without added risk factors. Reassess after 3 months.

Medication	**Investigation**
Levothyroxine	TSH annually
Antihypertensives	BP, Urea/Creatinine, Na/K, HbA1c, non-fasting lipids annually
Methotrexate	LFTs, FBC, CRP 3 monthly
Amiodarone	LFT, TSH 6 monthly
Lithium	Lithium level 3 monthly, BMI, Urea/Creatinine, Na/K, TSH 6 monthly
Statins	Non-fasting lipids at 1-5 year intervals according to clinical indication

Table 2. An example of a simple practice blood testing policy.

USEFUL RESOURCES:

The BMJ's Too Much Medicine initiative, which aims to highlight the threat to human health posed by overdiagnosis and the waste of resources on unnecessary care, emphasises the need to get the fundamentals of prescribing right. (https://www.bmj.com/too-much-medicine)

Choosing Wisely is an initiative of the American Board of Internal Medicine (ABIM) Foundation that seeks to advance a national dialogue on avoiding unnecessary medical tests, treatments, and procedures. https://www.choosingwisely.org/

Another useful resource is the HSE's Living Well Programme which is presently being delivered as an online programme during the COVID-19 restrictions period. https://www.hse.ie/eng/health/hl/selfmanagement/living-well-programme/

LIFESTYLE ADVICE

Lifestyle medicine is a medical approach that uses evidence-based behavioural interventions to prevent, treat and manage chronic disease. The key aspects of lifestyle habits and practices include healthy eating, active living, healthy weight, emotional resilience and environmental exposures (e.g., smoking/ alcohol).[84]

Lifestyle behaviours are the most significant risk factor for both mortality and disability.[85]

The power of positive lifestyle decisions is underscored by multiple randomised controlled trials and a variety of cohort studies e.g. the Nurses' Health Study demonstrated that 80% of all heart disease and over 91% of all diabetes in women could be eliminated if they would adopt a cluster of positive lifestyle practices including maintenance of a healthy body weight (body mass index [BMI] of 19-25 kg/m2); regular physical activity (30 minutes or more on most days); not smoking cigarettes; and following a few, simple nutritional practices such as increasing whole grains and consuming more fruits and vegetables.[86] The US Health Professionals Study showed similar, dramatic reductions in risk of chronic disease in men from these same positive behaviors.[87] In fact, if individuals adopted only one of these positive behaviours, their risk of developing coronary artery disease could be cut in half. [87]

A number of studies have demonstrated that intensive lifestyle interventions can have a major impact on the progression of, and even the reversal of, several chronic diseases eg. ischaemic heart disease,[88-89] diabetes mellitus[90-91] and prostate cancer.[92]

Most emissions in healthcare originate from secondary care where significant resources are used to deal with the acute complications of chronic disease.[24] The highest carbon footprint in primary care is from prescribing and this is mainly attributed to chronic disease management.[24] The combination of low cost, low carbon interventions to treat the upstream causes of many chronic disease has been described as a triple win for population health, economic budget and the planet.[93]

GPs are well placed as trusted sources of information within communities who have many opportunities to encourage the adoption of positive lifestyle behaviours through multiple encounters with families. The majority of the population (80%) want to have a better state of health but are not sure how to do it.[94-95]

The Chronic Disease Management (CDM) program incentivises GPs to embrace lifestyle factors as agreed targets for patients for their 6-month reviews. This active engagement with prevention should improve individual and population health while simultaneously decreasing the carbon footprint of resource use. This is a positive change in emphasis to tackling upstream causes of ill health and may require further education and training for practice teams in order to optimise the effectiveness of lifestyle change.

Motivational Interviewing skills have been shown to have positive outcomes in primary care chronic disease management.[96]

Simultaneously an ethos of positive lifestyle routines in the GP Practice could help improve the health and wellbeing of the practice team.

The following sections will expand on the prominent individual areas of lifestyle medicine- social prescribing, plant-based diets, and physical activity – including blue and green prescribing.

SUGGESTED ACTIONS: Lifestyle Advice

Training

- Consider a member of the team training in Lifestyle Medicine e.g. https://bslm.org.uk/ or https://www.eulm.org/
- Obtain training in motivational interviewing e.g.

  https://www.hse.ie/eng/about/our-health-service/healthcare-communication/motivational-interviewing/

Practice Actions

1. The practice registration form could include questionnaires on exercise, nutrition, stress.
2. Practice websites includes links for local lifestyle related resources Park Run, Men's shed, healthy eating etc;
3. Practice encourages lifestyle behaviours within practice team e.g., monthly step target; healthy snack swap; group meditation/ yoga

PHYSICAL ACTIVITY

If there was a pill that could reduce all-cause mortality by up to 30%, we would want to prescribe it. If there was no cost and no side effects even better. The great news is we can: those who achieve the daily recommended amount of 30 mins moderate activity can reduce their risk of premature death by up to 30%[97-98] The 2020 WHO report on physical activity estimates more than a quarter of the global adult population are not achieving adequate physical activity and there have been no increases in activity levels since 2001.[99]

Talking to patients about physical activity regularly increases someone's ability to make that change. Exercise prescriptions have shown to be effective in increasing patient activity levels.[100] The HSE has a free online course to help your communication and motivational skills, click here. It does not need to be a long conversation, simply allowing the person to discuss why they might change, arranging follow up or bringing it up again tends to lead to more successful outcomes. Check out Sustainability and Planetary Health on www.icgp.ie for online resources which includes a step-by-step guide on how to have conversations in clinical practice. It includes 1 minute and 5-minute consultations and information sheets with condition specific exercise programmes and diaries which can be printed off for patients.

A simple way to get someone started from a purely sedentary mode is by promoting NEAT: (Non-Exercise Activity Thermogenesis) examples are walking over to a colleague's desk, standing instead of sitting, parking your car a little further away etc.

RCGP and Sport England created a physical activity and lifestyle toolkit to be used by GPs. This has excellent tips on how to incorporate more activity into your daily practice and condition specific recommendations.

https://elearning.rcgp.org.uk/course/view.php?id=536

Cycling has both physical and mental health benefits as well as reducing your environmental footprint and it is cost effective (a triple effect)

There are many safe and accessible cycle routes in Ireland. https://www.activeme.ie/useful-info/top-cycling-routes-and-trails-in-ireland-best-irish-cycle-routes/

SUGGESTED ACTIONS: Physical Activity

- Encourage patients and staff to take active transport or public transport where feasible.
- Lead by example by having at least one member of staff who gets to work by any means other than a car.
- Ensure a safe place to store bikes, changing facilities +/- showers available etc.
- Link in with a local cycling advocacy group to support further cycling infrastructure.
- Make physical activity part of your CDM review.
- Have pdfs for patients on the benefits of exercise, be opportunistic, be specific (condition specific PDFs might encourage patients more)
- Here is a link from HSE: https://www2.hse.ie/file-library/health-eating-active-living/chair-based-exercises-for-older-adults.pdf
- Can staff be more active? Do you participate in ParkRun? At work can you all increase your NEAT? e.g., standing desks, walking to call patients in etc
- The practice endorses Brief Motivational Interviewing (HSE) by training one GP and sharing resources from the same.

PLANT BASED DIET

"Food is the single strongest lever to optimise human health and environmental sustainability on Earth."[101]

Carbon Footprint

Most activity to limit climate change has focused on decarbonising energy and transportation, but attention is increasingly turning to the role that food plays in producing greenhouse gas emissions. The global food chain contributes over a quarter of all greenhouse gas (GHG) emissions.[102] The global food system is also the primary driver of biodiversity loss, causing deforestation, emptying our oceans and polluting waterways, leading to loss of ecosystems, insect collapse, and loss of plant and animal species.[103-104-105] Ireland had the second highest emissions rates per capita in the European Union in 2019, and agriculture, at 37%, is the single largest contributor, the majority of which comes from methane from livestock and nitrous oxide due to the use of nitrogen fertiliser and manure management.[106] Red meat and dairy have markedly higher emissions than other foods and these two groups make up 30% of calories but almost 80% of emissions from the average Irish diet.[107] A recent study from TCD concluded that the current Irish diet is rich in unsustainable foods, is causing nutritional and financial problems and is not good for the environment.[108]

Food production i.e. land use and farm-stage emissions, account for more than 80% of the carbon footprint for most foods.[102] Transport is a small contributor to emissions accounting for less than 10% for most food products so the food choice plays a much more significant role than the origin of the food.[107] Substituting less than one day per weeks worth of calories from beef and dairy products to chicken, fish, eggs, or a plant-based alternative has been shown to reduce GHG emissions more than buying all your food from local sources.[109]

With a projected global population increase to 10 billion by 2050 we will need to increase food production by 50%.[101] Livestock uses about 100 times as much land to produce a kilocalorie of beef or lamb versus plant- based alternatives.[102] We need to consider better use of land in order to also plant more forests as carbon capture is equally as important as decreasing emissions. Food waste should also be tackled to decrease food related emissions.

Healthy Diet

Nutrition is closely linked to health. The largest study of disease risk factors, the Global Burden of Disease Study, has consistently confirmed diet as one of the strongest risk factors for both disease and disability.[85] The comprehensive Eat Lancet Commission report has calculated what would be the healthiest diet that could safely feed the world's growing population without exceeding planetary boundaries.[101] The consensus from both studies above is that we need to move from a dietary pattern currently focused mainly on animal and processed foods to consume a diet mainly composed of whole plant foods.

A plant- based diet is one that focuses mainly on unrefined, whole fruit, vegetables, wholegrains, legumes, nuts, and seeds as staple foods. The EAT Lancet Commission defined a healthy diet, mainly based on the plant-predominant traditional Mediterranean diet, with an optimal caloric intake and consisting largely of a diversity of plant-based foods, low amounts of animal source foods, containing unsaturated rather than saturated fats, and limited amounts of refined grains, highly processed foods and added sugars.[109]

Plant-based diets have been associated with lowering overall and ischemic heart disease mortality and decreasing the incidence and severity of high-risk conditions, including obesity, hypertension and hyperlipidaemia, and even possibly reversing advanced coronary artery disease and type 2 diabetes.[88-90-110-112] The benefit of a plant predominant diet is likely due to a combination of many factors, including a lower energy density, higher intakes of vitamins, minerals, unsaturated fats and fibre, as well as a reduction in saturated fat, sugars, salt and red and processed meats. There is also clear evidence that replacing animal protein with plant-based protein results in lower rates of stroke, heart disease, diabetes, and overall death rates.[113-117]

Healthcare professionals are seen as one of the most trusted sources of information on diet and health.[118-119] Despite this there is evidence of poor adherence to good nutrition advice in health-care settings.[120] Nutrition does not play a prominent role in undergraduate and postgraduate GP training despite it being identified as an unmet need. A 2019

survey of all 14 Irish GP training schemes found that both GP trainees and program directors agreed that nutrition was an unmet need in their education and crucially within their consultations. There was consensus that more training is needed and that it would be welcomed by trainees and program directors alike.[121] Similarly, a recent systematic review focuses on the importance of improving knowledge and skills of health professionals in this area.[122]

GPs in their trusted role among patients and responsibility in preventing and managing the increasing burden of chronic disease have ample opportunity to use the strong lever of recommending "*... a diet rich in plant-based foods and with fewer animal source foods to confer both improved health and environmental benefits*".[101]

SUGGESTED ACTIONS: Plant Based Diet

- Consider staff member obtaining education in plant-based nutrition e.g. Winchester or Cornell University course e.g.,
  - https://ecornell.cornell.edu/certificates/nutrition/plant-based-nutrition/
  - https://www.winchester.ac.uk/study/further-study-options/short-courses/plant-based-nutrition

In the Consultation

- https://plantbasedhealthprofessionals.com/factsheets have concise and specific dietary information on how to assist medical conditions like HTN, Diabetes, Cholesterol etc. Good resources for CDM consultations.
- Set positive plant food targets for patients as part of CDM (Chronic Disease Management) program 'agreed lifestyle goals' e.g., a daily handful of blueberries, greens, or unsalted nuts with the changes recorded or audited over time.
- The practice has a selection of simple plant-based recipes that are available for patients on their website or that can be handed out to encourage cooking at home and expanding their repertoire.

In the practice

- The practice has one educational meeting for staff re the benefits of a whole food plant-based diet and is aware of resources.
- The provision of a seasonal fruit bowl as a healthy snack option or plant-based milks (1/3 the emissions of cow's milk) could enhance the health of the practice team and footprint.
- A plant-based pot-luck lunch or optional plant-based baking e.g., monthly rota, could increase awareness, knowledge and exposure to the practice team of healthier more planetary friendly ways of eating.

SOCIAL PRESCRIBING

Socioeconomic factors have consistently been found to have a greater impact on health than healthcare.[123] For example, economic hardship is highly correlated with poor health,[124] whereas increased levels of education are strongly and significantly related to improved health.[125] Also, it is suggested that improved housing conditions and greater access to green spaces should have a positive impact on health.[126]

Social prescribing, also sometimes known as community referral, is a means of enabling health professionals to refer people to a range of local, non-clinical services.[127] This is done through link workers who give people time, focusing on 'what matters to me', taking a holistic approach to people's health & wellbeing before connecting them to community groups and statutory services for practical and emotional support.[128] Social prescribing then works for a wide range of people, including those:

- with one or more long-term conditions
- who need support with their mental health
- who are lonely or isolated
- who have complex social needs which affect their wellbeing

There is emerging evidence that social prescribing not only improves health and wellbeing but can also lead to a decrease in use of GP/Hospital services.[129]

The expansion of social prescribing in Ireland is a commitment in the 2021 Programme for Government and is an action in many recent strategies and policies, including Sharing the Vision 2020-2030, the Sláintecare Implementation Strategy and Action Plan 2021-2023, and the Healthy Ireland Action Plan 2021-2025.[130] Thus, social prescribing services are now being delivered in 30 locations around the country by community-based organisations such as local development companies and family resource centres, supported by the HSE, Sláintecare and Healthy Ireland. There is a plan to further roll out social prescribing to all of primary care in Ireland, as is the case with GP within the NHS.

Figure 7. A model which shows the key elements that need to be in place for effective social prescribing.[128]

Suggested Actions: Social Prescribing

1. Go to www.hse.ie and search for social prescribing and self-management for excellent resourcesand see how this social prescribing programme based in Donegal for patients who need some support to mind their health and wellbeing or if they feel isolated, stressed, anxious or depressed works.

2. Go to the position statement summarising the common ground for social prescribing and lifestyle medicine from five European countries which provides universal takeaway messages for any healthcare providers interested in combining social prescribing with lifestyle medicine practice at https://www.mdpi.com/1660-4601/18/19/10096

3. Select staff members to acquaint themselves with the HSE Social Prescribing Framework document. https://www.hse.ie/eng/about/who/healthwellbeing/our-priority-programmes/mental-health-and-wellbeing/hse-social-prescribing-framework.pdf

4. Find out if your CHO has access to a social prescriber. If so, get in touch, find out how to refer, meet the team and find out what they can offer.

5. Contact Ms Orla Walsh, Project Manager, HSE Mental Health & Wellbeing programme at orla.walsh7@hse.ie to find out more about the social prescribing services in your area.

6. Add social prescribing to your CDM/frailty reviews.

7. In the absence of a social prescriber, make use of other services such as ALONE or Mens Shed to refer to.

GREEN PRESCRIBING

Green prescribing is a physical activity outdoors e.g., walking, cycling, gardening, etc.

There is cumulative evidence that green spaces (e.g., parks, forests, gardens), blue spaces (e.g., rivers, seaside, ponds, lakes) and natural spaces in cities are critical for wellbeing. The WHO has stated that accessible green spaces are a necessity for the health of future cities.[131]

There is also compelling evidence that green spaces are beneficial for mental health, physical fitness, immune system function, as well as community resilience and environmental health.[132]

While the use of the terms green prescribing is relatively new the concept of nature-based therapies have been applied for centuries e.g., the Romans used thermal springs, or Japanese forest bathing (*shinrin-yoku*) for physical and mental benefits.[133] Modern medicine is still catching up with the evidence of the benefits of structured, supported and sustained contact with nature, but if the evidence base is sound then why not be referred for walking, crafts, gardening, mindfulness or tai-chi? Such activities have psychological benefits but also lead to increased community reliance and a deepening of social connectedness.[134]

Time spent in nature also has preventative qualities by helping to maintain a sense of wellbeing, happiness and belonging. There is emerging evidence that gardening may prevent falls, as well as ameliorate loneliness.[135] It is no accident that gardens are now a feature in rehabilitation hospitals and programmes are included in their rosters. Dementia studies have shown that access to gardens can reduce aggression, agitation, and other behavioural disorders, juxtaposed with the poor evidence base for antipsychotics, which are more frequently used.[136]

Green spaces can also act as buffers for extreme weather events and can even mitigate pollution (e.g., air, noise).[137] Green and blue areas have a cooling effect that can protect against severe heat and floods, which unfairly effects areas of deprivation disproportionately.[138]

Examples

GPs in New Zealand have been using Green Prescribing for years, 80% of GPs there say they have recommended a green prescription over a medication.[139]

A report of a pilot project run by the HSE in Donegal 2013 found improved physical activity, increased well-being, and reduced blood pressure in participants.[140]

There is evidence that green environments may accelerate post-operative recovery as well as improving pain control.[141-142]

Practice Ideas

1. Discuss green prescribing in the practice and agree a plan with specific recommendations and a list of local resources.

2. You may have a link worker in your area who can help with this.

3. A member of staff such as a GP trainee or member of admin with an interest in this area may embark upon a mapping project of your area to see what your local natural amenities are and how your patients may access them.

4. See ICGP ParkRun initiative, sign your practice up for a weekly dose of green spaces, community, and physical activity. https://www.icgp.ie/go/in_the_practice/parkrun

PROMOTION OF BREASTFEEDING

Policies around sustainable food must include promotion and support for breastfeeding. Breastfeeding provides the ideal form of nourishment for babies. The associated infant and maternal health outcomes produce healthier populations that use fewer healthcare resources.[143-144]

Breastfed babies have lower incidence of obesity and diabetes in later life. In part, this may be due to specific endogenously synthesised peptide hormones, such as leptin which are not significantly present in infant formula.[145]

Ireland has one of the lowest breastfeeding rates in the world. The breastfeeding initiation rate of 62.3% in maternity hospitals in Ireland is among the lowest in the world, compared to rates of 90% in Australia, 81% in the UK and 79% in the USA.[146]

As healthcare professionals we have a responsibility to encourage breastfeeding and be aware of where to signpost for support within our communities for breastfeeding mothers.

While the benefits of breastfeeding are widely promoted the environmental harm caused by breast milk substitutes (BMS) are less well known. Breast milk has zero or minimal waste. BMS is predominantly composed of cow's milk. Dairy and meat production account for a large proportion of the greenhouse gases of the food industry which in turn accounts for almost a third of greenhouse gases. The average water footprint of whole cow's milk is around 940 L/kg: one kilogram of milk gives about 200 g of **milk powder, meaning the water footprint of milk powder alone is roughly 4700 L/ kg**[147-148] Methane production from livestock is second only to production by the oil and gas industry,[149] and methane traps heat in the Earth's atmosphere 30 times more potently than carbon dioxide.[150]

Cows' milk is not nutritionally adequate for a developing infant; therefore, supplementation is mandatory. Additives are necessary e.g., palm oil, coconut, rapeseed, and sunflower oils; fungal, algal, and fish oils; and minerals and vitamins. The use of these resources has an added and indisputable effect on the environment. (144)

SUGGESTED ACTIONS: Breast Feeding

- Ensure all healthcare staff are aware of local breastfeeding services.

  https://www.lalecheleagueireland.com/

  https://www.friendsofbreastfeeding.ie/

  https://www.alcireland.ie/ (the association of lactation consultants Ireland)

- Discussion around breastfeeding should be a mandatory part of the antenatal visit, have resources ready to go (see above). It should also be part of the 2- and 6-week check.

- Ensure your practice is breastfeeding friendly e.g., posters, website etc.

- Highlight and promote breastfeeding in your practice e.g., via website. World breastfeeding week is usually the first week in August.

IN THE OFFICE

The practice building and office environment provide ample opportunities to tackle our carbon footprint. Despite the largest gain in terms of health and environmental benefits being found in patient care within the consultation, the foundation of a 'Greener Practice' should involve the whole practice team.

Raising environmental issue in practice team meetings can identify or encourage potential Green 'champions' and leaders. Morale and team spirit can be elevated with agreed common goal setting for objectives e.g., recycling, electricity savings and 'cycle to work' schemes.

The HSE have a sustainable energy page with lots of practical easy to follow tips on how to make your office more sustainable and efficient: www.hse.ie/sustainability

RENEWABLE AND REDUCING CONSUMPTION OF ENERGY:

Websites such as switcher.ie have plenty of information on making the transition. There are currently four energy suppliers in Ireland that are known as being 100% renewable. These are: Energia, Panda Power, Pinergy and SSE Airtricity.

It is not only the amount of energy we use but also the type that has a direct impact on climate change. The 2030 EU Climate targets for Ireland aim for a 32% share in renewable energy and a 32.8% improvement in energy efficiency. Ireland comes 27 out of 28 countries in terms of renewable heat. (11)

REDUCING ENERGY CONSUMPTION

Switching off a computer at the end of the day can save considerable energy and costs over time. Two thirds of a computer's energy goes on powering the monitor and screen savers do not save energy.

Energy efficient bulbs are more expensive to buy up front but mostly amount to significant reductions in energy use over the course of a year e.g., an incandescent 75-watt bulb which might cost a few euro can cost you ten times the amount in electrical bills versus a LED which has an initial once off higher cost.

Ecosia is the preferred internet search engine for all computers. Ecosia earth engine donates 80% of its profits to reforestation in areas that need it most. By using this search engine, you are helping plant trees (see link: https://www.youtube.com/watch?v=z1AVgbI_1r0)

Ireland is 27th out of 28 countries in terms of renewable heat usage. Heat accounts for 39% of energy consumption in Ireland. Ensure you are appropriately dressed.

SUGGESTED ACTIONS: Energy Use

- The practice switches to a renewable energy provider
- The practice assesses its use of energy and uses measures to become more efficient where possible, see tips below.
- Switching off: Ideally nominate a person responsible for ensuring all computers, lights etc switched off at the end of the day. if it must stay on ensure that they are in sleep mode.
- Use posters or prompts to encourage turning off lights and utilities as you go.
- Use instant boilers or else low energy kettles and only fill to what is needed (consider the number of cups of tea and coffee made every day, it all adds up!)
- LED light bulbs are used, and the greenest (thinnest) fluorescent tubes are used.
- Is it possible to turn down the thermostat by a degree? This simple measure can save up to 10% off your heating bill. Consider turning off your hot water tap if this is considered safe to do.

WASTE: A recent survey of acute hospitals in Ireland found that general waste contained up to 47% of recyclables and food waste that could be diverted from landfill. Each ton of recycled paper can save 17 trees, 2.2 cubic metres of landfill space and 7,000 gallons of water.[152]

Keep health care waste (HCW) away from public areas and sinks where paper towels etc can be thrown in easily. Only 66% of the waste in yellow bags is healthcare risk waste. We need to address this because healthcare risk waste is the most expensive waste to dispose of.[153] HCW costs approximately 1849 Euro per tonne to manage whereas general landfill is approximately 130 Euro per tonne.

You can dispose of used batteries in special blue boxes which are located in many retail outlets, including your local supermarkets, or at your local Waste Electrical and Electronic Equipment (WEEE) drop off point or recycling centre. When disposed of in an unlined landfill, a battery can leach its toxic constituents and contaminate groundwater, resulting in possible exposure to humans.

Trees use carbon dioxide to produce food. They store significant amounts of carbon, but they also improve air quality and can be a calming presence for many people.

The HSE has a sustainable energy page with lots of practical easy to follow tips on how to make your office more sustainable and efficient: www.hse.ie/sustainability

SUGGESTED ACTIONS: In the office

- Toner cartridges are recycled.
- Practice has a policy to email or text where GDPR compliant and to use window free envelopes for outgoing mail.
- The practice examines its use of single use plastics in the practice and takes steps to stop their unnecessary use in the workplace.
- Plan how the practice will assess its virtual consults, what is the long-term plan? virtual to replace **some** traditional consults?

The NHS found that the provision of telehealth and telecare for people with long-term health conditions in the community could bring returns of £5.1M in health care savings, a reduction of 67,000 tons of CO2 and 5,671 quality adjusted life years.

- Educate all staff members on recycling policy, make recycling easy. Label bins clearly, familiarise yourself with your local facility and there should be as many bins as there are recycling options.
- Reduce paper use by going paperless where possible, where paper is necessary ensure, all staff know how to double side print/copy.
- Is it possible to reduce amounts in the yellow waste bags? www.HSE-healthcare-risk-waste
- Agree a policy of using minimum 70% recycled paper. This applies to toilet, kitchen, and hand towels. Discontinue unnecessary literature most of which is available online. Stop junk mail.

- Green procurement:
  - A policy of requesting the “green” or sustainable option for all procurement is initiated e.g., cleaning products, stationary, single use items
  - Have a practice policy going forward to only purchase rechargeable equipment.

- Installing a dual flusher and fixing a dripping tap can save up to 40,000 litres of water per year.
- You may have the potential to plant trees in the area surrounding your surgery/have insect friendly plants.

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Quality improvement for enhanced respiratory care

Sean Owens provides guidelines on auditing asthma care that will optimise inhaler prescribing and measure their carbon footprint

MANY OF OUR TARGETS for a healthier planet are triple wins: good for the patient, good for the environment and good for the economy. Asthma chronic disease management is no exception and offers a rare chance for practices to improve patient care significantly as well as lower their environmental footprint.

The GINA guidelines 2022 state that dual therapy (ICS/LABA) is the preferred treatment for asthma in adolescents >12 years and adults.[1] Compared with PRN use of SABA (salbutamol), the risk of severe asthma exacerbations was reduced by 60-64% (SYGMA 1, Novel START).[2,3]

SABA has been the mainstay and first-line treatment for the past 50 years, when asthma was thought to be a disease exclusively of bronchoconstriction. There is now a better understanding that asthma is, even when mild, inflammatory in nature, hence inhaled steroids are now always indicated in management.

There has been a fundamental shift in longstanding advice of "blue for relief, brown for prevention" to move away from treating asthma with SABA as monotherapy. Furthermore, if SABA is needed, it should always be taken with ICS. For patients this translates into a very different and more simplistic message: "use your combination inhaler for prevention and again if needed for exacerbations".

The British Thoracic Society recommends that health professionals should prescribe an inhaler with a lower carbon footprint when clinically appropriate.[4] The ICGP Quick Reference Guide for asthma also concurs.[5] The Climate Action and Low Carbon Act 2021 commits Ireland to reducing greenhouse gas emissions by 51% by 2030.[6] The healthcare sector is responsible for approximately 4% of Irish emissions and will not be exempt for the journey to net zero.

The main carbon hotspot in primary care is not plastic or paper, it is prescribed medications. Inhalers account for approximately 4% of the carbon footprint of the entire health sector, of which metered dose inhalers (MDIs) such as Ventolin have a disproportionate global warming potential.

Fortunately, there are suitable dry powder inhaler (DPI) alternatives widely available and suitable for the majority of patients that may not only reduce the environmental impact but also markedly improve disease management.

Audit

Choose a time period to audit (most prescriptions are requested and refilled on a three- to six-monthly basis); hence a three-month cycle may capture a fair reflection of prescribing practices. As coding is usually suboptimal in practice, it may be more accurate to search for prescribed or dispensed inhalers than to search for asthma patients, or you can use a combination of search parameters to find which patients have been prescribed inhalers.

There are a huge number of wholesalers and parallel importers for inhalers and usually they are individually named. Unfortunately, you will need to include each of these in your search. Search parameters can usually be saved, making reaudit much easier.

The three-month retrospective search should return a list of patients who have been prescribed inhalers of interest.

In Ireland inhalers are schedule S1B; this means irrespec-

Table 1: Example input table

	Carbon equivalent (gC02 per inhaler)	Cycle 1	Cycle 2	Carbon equivalent difference (gC02) per month
High-volume SABA, eg. Ventolin	25,260			
Low-volume SABA MDI, eg. Salamol	9,870			
SAMA MDI, eg. Atrovent	14,590			
ICS MDI, eg. Becotide	20,350			
ICS/LABA HFA 134a MDI, eg. Seretide	19,650			
ICS/LABA HFA 227ea MDI, eg. Flutiform	36,500			
DPI	1,000			

Table 2: Example input table MDI:DPI ratio

	MDI:DPI
Cycle 1	X:Y
Cycle 2	X:Y

tive of how many repeats are on the prescription, they can be refilled monthly as per clinical need and pharmacist discretion. Therefore, the potential impact of prescribing an inhaler once may be repeated a further five times.

Your list of returned names is now your database for your patients who are potentially prescribed a given inhaler(s) every month (cycle 1). While the reality may differ, this is an estimate of the monthly potential carbon footprint of your prescribing.

For audit completion it is advisable to have a follow-up audit (cycle 2) after an intervention, usually a team educational intervention which you may lead.

Irish Doctors for the Environment (IDE) has a pdf which is an easy to follow step-by-step guide on green prescribing. This is the recommended educational intervention for all prescribers and nurses in the practice. It only takes a few minutes to read through.

There is also a published sample audit and some other resources:**https://ide.ie/resources/healthcare-sustainability/** (see also table above). The intervention and discussion with patients regarding switching can be opportunistic or part of the asthma CDM programme.

A 2019 paper by Wilkinson et al estimated the potential carbon footprint of the MDIs per inhaler by class and propellant type.[7] Sources were from manufacturers data, patents and other cited sources. DPIs were estimated each to have a uniform carbon footprint of 1kg C02 per inhaler for ease of calculation. For ease and reproducibility, these estimations can be used for your audit: see Tables 1 and 2.

Results

Input your results in something similar to the example *Table 1*, grouping inhalers by type and class. Input the number of inhalers prescribed for cycle 1 and cycle 2. It may be a useful visual aid to determine the ratio of MDI:DPI for cycle 1 and cycle 2 *(Table 2)* to track progress and for future audits.

Use the table to calculate the total carbon equivalence per month and multiply x 3 to see the potential carbon saved from your audit over the previous three months. Recall that these savings continue on into the future and owing to greater ease of use, better drug delivery and enhanced patient autonomy there are likely to be greater savings from reduced flares and presentations for unscheduled care.

Remember to continue to monitor for SABA usage, inhaler technique and to text or email quick reminders and resources about how to use inhalers, the importance of exercise, smoking cessation, nutrition and where to recycle inhalers (see www.**asthma.ie**).

Please do let Irish Doctors for the Environment (IDE) primary care working group, or the ICGP Sustainability Working Group, know of your progress.

If you partake in this audit and wish to have your results included as part of a larger collective drive to assess our progress, please contact primarycare@ide.ie

Any queries regarding audit/troubleshooting etc,please send an email or ask to be added to the IDE primacy care WhatsApp group.

Good luck! This is an exciting opportunity to improve care of our patients with asthma and reduce our carbon footprint.

Useful resources

- **Audit of the carbon footprint of inhalers in an Irish general practice. https://imj.ie/audit-of-the-carbon-footprint-of-inhalers-in-an-irish-general-practice/**
- **https://greeninhaler.org**
- **https://www.asthma.ie/about-asthma/resources**

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