2019 Non-Communicable Diseases portfolio

Intersectoral collaboration and the Sustainable Development Goals

Team

Branch editor and researcher: Akhila Jayaram

Editor: Dr Tim Lindsay

Researchers: Lara Vecchi & Isabella Weber

Contributors: Catherine Dabrowska & Aaron Fleming

Commissioner:

Professor Neil Squires

Public Health England

Executive Summary

Title: Intersectoral collaboration and the Sustainable Development Goals

Keywords: Intersectoral, collaboration, sustainable, development, goals, SDGs

Background: The Sustainable Development Goals (SDGs) comprise an expansive and ambitious agenda across 17 themes and 169 targets. The SDGs explicitly emphasise that the individual themes and targets are fundamentally intertwined and cannot be achieved without a cohesiveness of planning and attention between them. We, therefore, propose that intersectional collaboration is essential to achieving the SDGs. However, what such collaboration looks like at this level is less clear.

Discussion: Some policymakers have celebrated the interconnectedness of the SDGs as a leap towards creating coherence across themes that require mutual support and have shared goals. Others, however, have noted that some of the goals come into conflict with one another when specific regional and local issues collide. A requirement for intersectional collaboration is, therefore, simultaneously self-evidently necessary and a challenge.

We identify three examples of previous intersectoral collaboration to address a variety of issues – tobacco use in Austria, diabetes, and HIV. We evaluate the approaches taken to combat these health issues such as the FCTC and MPOWER framework and draw parallels with the SDGs. In doing so, we highlight methods of intersectoral collaboration that could be adopted to address the SDGs.

Conclusions: We identify past examples of successful intersectoral collaboration to provide a model for the utilisation of intersectoral collaboration in the future. Those working on the SDGs should not see intersectoral collaboration as applicable to only one type of goal or target, but rather as a framework that can be adapted and adjusted to suit the desired outcome. The complexity and interconnectedness of the SDGs demand an integrated and indivisible approach. In this respect, intersectoral collaboration could be the key to success.

Table of Contents

Table of Figures

Table of Tables

Acknowledgements

The Polygeia NCD team would like to thank the Commissioner, Professor Neil Squires, Director of Global Public Health at Public Health England, and Tristana Perez, Partnerships Officer at Public Health England for the conception of the project and their support and guidance throughout.

We would also like to thank the broader Polygeia community for their contribution to the project, particularly the Head of Policy, Raihan Mohammed, for establishing the initial contact with the Commissioner.

Disclosures

The authors declare that they have no competing interests.

Abbreviations

ART	Antiretroviral Therapies
CCGs	Clinical Commissioning Groups
ERS	Exercise on Referral Scheme
FCTC	Framework Convention on Tobacco
IC	Intersectoral Collaboration/Intersectoral Action
MDG(s)	Millennium Development Goals(s)
PLHIV	People Living with HIV
SDG(s)	Sustainable Development Goal(s)
UNCDP	United Nations Committee for Development Policy
UNDP	United Nations Development Programme

Background

The Sustainable Development Goals (SDGs)

The 2030 Agenda for Sustainable Development, encompassing the Sustainable Development Goals (SDGs), was officially adopted by the United Nations General Assembly in September 2015[1]. Intended as a roadmap for policy making and budget allocation for the United Nations Development Programme (UNDP), the SDGs more broadly replace the Millennium Development Goals (MDGs) assumed in 2000, which focused almost exclusively on the alleviation of extreme poverty in the developing world. In contrast, the SDGs set a more expansive and ambitious agenda, seeking to engage all countries as stakeholders, although many of the goals only partly achieved in the MDGs have been incorporate into the themes of the SDGs. Whilst the MDGs spanned 8 themes overall and set 18 targets to be reached by 2015, the SDGs incorporate a more expansive and heterogeneous 17 themes with 169 targets. The SDGs explicitly emphasise that the individual themes and targets are fundamentally intertwined and cannot be achieved without a cohesiveness of planning and attention between them[1].

Figure 1: The 17 Sustainable Development Goals as laid out by the United Nations Development Programme[2].

Cross theme integration

The UN General Assembly Resolution on the SDGs highlights the "integrated and indivisible" nature of the 17 themes[1]. The interconnectedness of the SDGs has been celebrated by some policy makers as a leap towards creating coherence across themes that require mutual support and have shared goals[3]. Others, however, have noted that some of the goals come into conflict with one another when certain regional and local issues collide[4]. For example, reducing climate change (Goal 13) potentially conflicts with increasing affordable energy access in developing countries (Goal 7). In places, the public infrastructure and local knowledge required for the supply of green energy is decades behind the developed world[5]. Therefore, the demand for a quick and cheap supply of energy, which could lift millions out of poverty and drive local economic activity, is met by fossil fuels[6].

Indeed, trade-offs between the growth of economies, the preservation of a sustainable ecology and climate, and the promotion of human well-being are posited to be central to the very concept of sustainable development[7]. The need to balance complex and, at times, seemingly competing demands, was acknowledged as a core challenge even before the adoption of the SDGs in the nascent years of sustainable development studies and theory[8]. It is in this vein that the SDGs make an explicit reference to a theme of "leaving no one behind" and to "reach the furthest behind first"[9].

That is not to say that such a goal is easy. The United Nations Committee for Development Policy (UNCDP), a subsidiary body which provides independent advice on the United Nations development agenda, states that "the pledge to leave no one behind is seldom disputed in principle, but the complexity of its practical implementation is often insufficiently acknowledged…to leave no one behind, international action must be coherent."[10]

Is intersectoral collaboration the answer?

In light of this highly complex environment where there is a constant need to consider trade-offs, distributional effects and short- and long-term consequences amongst a myriad of local, regional and national interests, it is clear that a strategy for the resolution of disputes and

rationalisation of competing demands is important. Intersectoral collaboration (IC) has been proposed as one such strategy.

Intersectoral collaboration, or intersectoral action, describes a variety of ways that individuals or organisations may work together, with varying degrees of collaboration and integration[11]. Horwath et al. identify five different levels of collaborative partnerships, existing along a continuum[12]. These are:

1) Communication: individuals from different disciplines talking together.
2) Cooperation: low key joint working on a case-by-case basis.
3) Coordination: more formalised joint working, but no sanctions for non-compliance.
4) Coalition: joint structures sacrificing some autonomy.
5) Integration: organisations merge to create a new joint identity.

Graphically, this continuum can be depicted as in Figure 2.

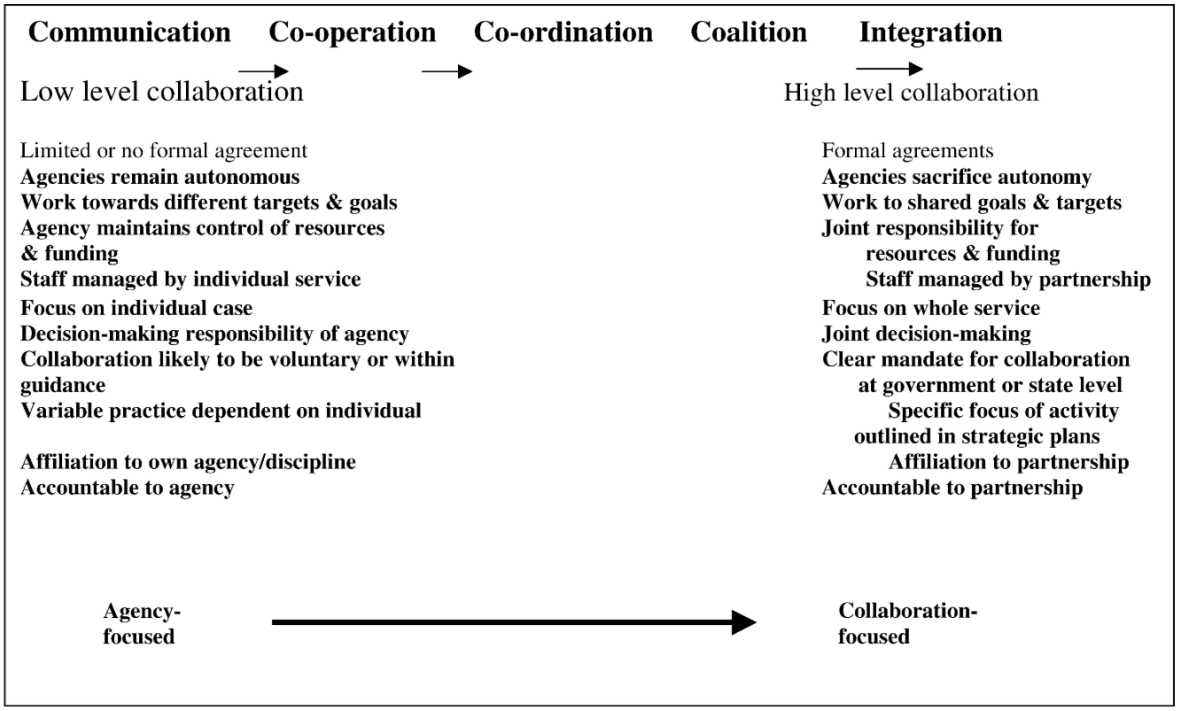

Figure 2: The features of collaborative endeavours as presented by, and taken from, Horwath et al.[12]

As summarised by Tooher et al, integration can further be distinguished, ranging from functionally independent to fully integrated[11,13,14]. As collaboration becomes more complete, structures relating to the governance of the organisations become increasingly formalised, with an expectation of shared resources, shared responsibility, and, ultimately, greater success in relation to the target outcome[11].

IC has been championed as a key factor in a multitude of health sector activities, ranging from increasing physical activity in Korean cities[15], to a core strategy in targeting communicable diseases[14,16], to a path to health equity[17,18]. Indeed, the World Health Organisation has made IC a pivotal part of their Health Equity strategy, and are building a body of evidence to support it[19]. Yet there are also critics of IC, such as those who have expressed concerns over the possibility of achieving clear shared goals and objectives for public policy[20]. It is therefore important to consider what can be learnt from the past implementation of IC, so to establish models of best practice that can be replicated moving forward.

In this report we reflect upon previous examples of IC across the continuum as presented by Horwath et al.[12]. In doing so, we draw parallels between successful projects of the past, and the ambitious goals and targets of the SDGs. Specifically, we use the examples of the Framework Convention on Tobacco (FCTC), the MPOWER framework and varying approaches to diabetes care.

Methods

We conducted a scoping review to identify specific Sustainable Development Goals that, by their nature, are particularly reliant on wide reaching collaboration to drive the successful obtainment of their targets. Once identified, researchers conducted a further scoping review to identify historical examples of intersectoral collaboration that could provide a framework for the broader adoption of IC to address the SDGs.

Researchers implemented a qualitative approach to critically evaluate the success of these programmes or initiatives, and then drew hypothetical parallels as to how lessons derived from these initiatives could be applied in the future. The researchers then formulated a narrative dialogue contextualising the historical examples and provided parallels with a specific SDG.

Each case study is presented in terms of:

1. A specific goal and its targets.
2. An example of intersectoral collaboration in the past.
3. Parallels that can be drawn between the past example and the target SDG.
4. Implications for the implementation of intersectoral collaboration to address SDGs that can be learnt from the past.

Tobacco control in Austria – A model for SDG 13?

Case study 1

The goal of SDG 13 is to "take urgent action to combat climate change and its impacts"[21]. It is further divided into 5 targets, as outlined in Table 1.

13.1	Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters
13.2	Integrate climate change measures into national policies, strategies and planning
13.3	Improve education and awareness and capacity on climate change mitigation, adaptation, impact reduction and early warning
13.A	Developed countries mobilising a joint $100 billion annually by 2020 to address needs of developing countries and fully operationalise the Green Climate Fund
13.B	Promote mechanisms for raising capacity for effective climate change planning and management in least developed countries and small island developing States, focusing on women, youth and local and marginalised communities

Table 1: SDG 13 targets[21]

Climate change is having a devastating impact worldwide[22]. This year saw the highest ever temperature recorded in the UK at 38.7 degrees with an associated increase in heat-related deaths from 1,100 to nearly 1,500 per day[23]. As a further example, prolonged periods of heat are drying out trees and shrubs and therefore fuelling forest fires[24]. Hence and justifiably so, climate change has assumed a prominent place in politics and the media. In turn, this has led to increasing climate activism[25], as well as uptake of simple, personal measures to help combat climate change[26].

Upon review of the targets of SDG 13 listed in Table 1, it is undeniable that they can only be achieved through an integrated and collaborative approach. Related actions are likely to range from those taken by governments in deciding, setting, and dictating policy, to a coalition of multiple stakeholders acting to increase education and awareness. As such, the type of IC required sits on the far end of the Horwath continuum[12], yet by contrast demand for change is largely being driven by those on the opposite end. Fortunately, despite the

enormity of the challenge posed by SDG 13, and the high level of collaboration required to address it, a previous framework can provide clues to a potential path to success; that of that of tobacco control and the Framework Convention on Tobacco.

Framework Convention on Tobacco (FCTC)

Even though the harmful effects of smoking have long been established, tobacco use still kills over 8 million people annually[27]. In 2003, the Framework Convention on Tobacco Control (FCTC) – an example of high-level collaboration and integration - was adopted by the World Health Assembly to tackle the root causes of tobacco related deaths. The Convention came into effect in early 2005 after being acceded, ratified, accepted or approved by 40 States[28]. The objective of the convention is stated as protecting "present and future generations from the devastating health, social, environmental and economic consequences of tobacco consumption and exposure to tobacco smoke"[28]. It is legally binding, evidence based and the first ever global health policy treaty. Currently, there are 181 members party to the convention, which represents more than 90% of the world's population[27].

The FCTC emphasises holistic policy in that it addresses demand reduction as well as supply issues. It is divided into 10 parts with different articles concerning specific aspects on tobacco control. Strategies to reduce demand are classed into price and tax measures and non-price measures including protection from tobacco smoke exposure, regulations on packaging and labelling, advertising, promotion and sponsorship, as well as education and public awareness. Illicit trade in tobacco products, sales to, and by, minors, and provision of support for economically viable alternative activities aim to reduce supply[28].

FCTC in Austria

Austria signed and ratified the FCTC in 2005, shortly after its 2003 conception. As a result, a new law was enforced prohibiting smoking in enclosed public spaces[29]. However, the law came with many exceptions, the main one being that it did not apply to the hospitality industry, drastically reducing its intended effect[29]. Since 2009, restaurants, clubs, pubs, and coffee shops larger than 50 square meters were obliged to either have a no smoking policy or separate smoking and non-smoking areas. However, this does not effectively protect non-

smokers from passive smoking, as the separation between smoking and non-smoking areas is often insufficient and smoke may still pass between the two spaces. For example, a study by Neuberger et al. from the Medical University of Vienna, showed that the concentration of harmful particulate matter is much higher in the non-smoking areas of venues that also have smoking areas, compared to a venue with a complete smoking ban[30]. This predisposes patrons and employees alike to a range of negative externalities related to passive smoke[31].

Despite this evidence, scientific studies evaluating the benefits of a smoking ban have been largely ignored by Austrian politicians[32]. Furthermore, so called public-opinion surveys carried out by special interest groups have been used as evidence that the majority of the Austrian population would oppose a total smoking ban[33]. Yet these surveys have been largely discredited by independent research groups. For example, an independent survey carried out by the European Commission showed that 63% of the Austrian population is in favour of a smoking ban in restaurants[34].

Despite these challenges, there is cause for optimism. Notwithstanding opposition and hurdles to date, as of November 1st, 2019, a complete indoor smoking ban in Austria has come into place[35]. This is no small achievement and involved a lengthy process and a variety of stakeholders - the Austrian tobacco industry, hospitality industry, the State, politicians, health insurance, media, general public, and NGOs amongst others – and therefore necessitated an intersectional approach. Here, we examine the contribution of each stakeholder to achieving a total ban on indoor smoking.

Stakeholder conflict

The Austrian tobacco industry consists of the company Austria Tabak, which, until recently, was State-owned. Clearly, this created a conflict of interest for the State; it is not possible to simultaneously reduce smoking, whilst at the same time prioritise earnings through the sale of tobacco products. Furthermore, the ÖKOLAB, a laboratory commissioned by the Austrian Government to control the composition of tobacco, is a subsidiary of Austria Tabak, raising more questions over further conflicts[36].

However, conflicts of interest are not limited to government. For example, there have been cases of lung specialists who cooperate with the tobacco industry to provide false evidence about smoking related health issues. One view is that these physicians choose to do so for monetary reasons, often to keep their institutes alive[37]. Additionally, the Austrian hospitality industry is a major stakeholder in tobacco legislation[38]. Restaurant, bar, and coffee shop owners feel forced to offer a smoking area for fear of losing customers to a competitor that provides one[39]. They also fear that a complete indoor smoking ban will have a negative effect on their revenue[39]. Hence, hospitality lobbying groups have had a major impact on the government's decision regarding indoor smoking law[29]. A change in the law in other countries has, however, shown the opposite; studies in North America and Europe provide evidence that introducing a smoking ban can increase revenue[39]. Potential explanations for this include the attraction of a smoke-free venue to families with children[39].

Role of the State

The State plays a key role in implementing the FCTC. Austria has not only been lacking in appropriate laws to ban indoor smoking, but also in legislation regarding the access to, and price of, tobacco products, especially cigarettes. Until recently, the legal age to buy cigarettes was sixteen. Cigarette taxes are amongst the lowest in Europe, with one pack of cigarettes costing around £4 compared to £10 pounds in the UK[40]. A law to completely ban indoor smoking in Austria was set to come into place in March of 2018. However, after a change of the ruling parties in parliament, the implementation was retracted. The Austrian People's Party had previously agreed to this law with its old coalition partner the Social Democratic Party. After new elections, the Austrian People's Party formed a coalition with the right-winged Austrian Freedom Party, in which they agreed to retract the smoking law, in exchange for the Freedom Party to agree to the Comprehensive Economic and Trade Agreement (CETA), a free-trade agreement between Canada and the member states of the European Union. It is speculated that the Austrian Freedom Party received generous donations for their election campaign from the Austrian tobacco industry and therefore insisted on cancelling the indoor smoking ban[32].

Role of the Public

By contrast, the retraction of the law to ban all indoor smoking resulted in an uproar in Austria. In response to this political decision, the Vienna Medical Association and the Austrian Cancer Aid Association started a petition called "Don't Smoke"[32]. The petition aimed to bring this issue to parliament for reconsideration, for which 100,000 signatures were required[41]. Within a few months, more than 800,000 people signed the petition[41]. With a population of 8 million people, this meant that 10% of the country signed the petition. This showed the strong public support to enforce the law against smoking indoors. Unfortunately, it did not result in a change in the law. Although efforts of the public were not sufficient to change the politicians' decision in this case, their importance should not be dismissed, as petitions and protests are effective means to get politicians' attention and at the core of a democratic society[41].

Role of NGOs

Implementation of a general smoking ban in Ireland was, in part, possible because of cooperation between the government and NGOs. The general public therefore, did not see the ban as being forced upon them by politicians, but rather an educated decision that would help to protect employees in the industry[39]. In Ireland, this was achieved through campaigns coordinated by organisations including the ASH (Action on Smoking and Health), Irish Cancer Society and Irish Heart Foundation. This cooperation is lacking in Austria. Manfred Neuberger, founding member of the Austrian Council on Smoking and Health, a non-profit organisation aiming to educate individuals on the risks associated with tobacco products, has previously decried the lack of sponsorship available for NGOs. Compounding this, on only one occasion has that NGO received money from the Ministry of Health. Neuberger highlights that this did not stop them from criticising the ministry, although this may have discouraged future funding[29].

Role of the Health Care System

One fifth of Austria's health care expenditure is spent on smoking related diseases[36]. Yet, the Federation of Austrian Social Insurance Institutions has neither been providing support for smoking cessation, nor has it initiated or supported anti-smoking campaigns. Working towards reducing smoking would cut a lot of costs for them[36], suggesting insurers would greatly benefit from contributing to achieving an indoor smoking ban.

In summary, there are complex issues and many stakeholders involved in tobacco control in Austria. Ultimately, the individual efforts have led to an indoor smoking ban as of November 1st, 2019. However, this process could and should have been accelerated with more focus on an intersectional approach. The FCTC is a legally binding convention, yet over 14 years passed between Austria signing the FCTC and banning indoor smoking; slow progress indeed.

Parallels with SDG 13

Given the complexity of this environment and the variety of stakeholders, it is easy to draw parallels with climate change. Industries of all sectors play a role in climate change. The top twenty fossil fuel companies contribute roughly 35% of energy-related CO_2 and methane[42]. This sums to 480 billion tonnes of carbon dioxide emissions since 1965[42]. However, the answer is not as simple as penalising fossil fuel companies. In that case, the goal of combating climate change may come in conflict with goal 8: sustainable economic growth. This is especially true for less developed countries where companies may have difficulties affording sustainable energy resources. It is therefore necessary to look at alternative models.

The FCTC is legally binding, but it does not impose penalties when not implemented. Austria has often been referred to as the ashtray of Europe[33]. One would think that advancements in other European countries would provide pressure and support for Austria to improve its anti-tobacco legislation. However, as highlighted above, decisions regarding Austrian laws on tobacco seem to be influenced by national stakeholders only. In contrast to the FCTC, the SDGs are not legally binding. This means that there is no legislative pressure to implement the goals, potentially decreasing uptake. Then again, as opposed to tobacco laws, efforts of neighbouring countries may have a larger effect on SDG implementation. This is in part due to the fact that the SDGs are goals that were collectively agreed upon and require global collaboration to be achieved; France's smoking policy does not implicitly affect Austrian smokers, but its climate policy does. Furthermore, the progress of the FCTC is tracked through reports which are submitted by each country, whereas the progress towards the SDGs is discussed at meetings where contributing nations meet. There is a larger sense of responsibility and the meetings allow for confrontation if certain nations are not achieving the set targets.

Role of the State

As with the implementation of the FCTC, the government also plays a major role in combating climate change. For example, governments could invest in public transport to give people the opportunity to decrease means of private transportation and therefore reduce their carbon dioxide emissions. As opposed to tobacco legislation, Austria can be viewed as a role model regarding availability, quality and accessibility of public transportation. As an example, university students pay a mere 150 euros and adults 365 euros per year to use all means of public transportation in Vienna[43]. Furthermore, the city of Vienna has an extensive network of bike lanes and city bikes that are very affordable and convenient to travel around the city with. Additionally, the Austrian Government is planning to impose a carbon tax[44]. There has been some opposition to this, as this would make commuting to cities from suburban areas very expensive, as there are few alternatives in terms of public transport available in these areas[44]. However, all the above examples work towards combating climate change and show how active and progressive the Government is in this area, especially compared to their actions in tobacco legislation.

Role of the Public

Greta Thunberg started her fight to combat climate change at a school strike in Sweden and has since travelled the world to give speeches and take part in protests. Thunberg‘s speech at the United Nations COP24 in Poland and at the UN Climate Conference in New York reached millions of people[45]. As a result of her efforts, an estimated four million people in thousands of cities around the world united for global climate protests on September 20th, 2019[46]. Greta Thunberg has also received a lot of attention for her efforts to combat climate change by adjusting her lifestyle; Thunberg does not take planes, but rather trains and sailboats, and follows a vegan diet. Aside from Thunberg, other people of public interest have also made efforts to help combat climate change. For example, Leonardo DiCaprio who produced the movie Cowspiracy highlighting the environmental impact of the meat industry, as well as athletes such as Novak Djokovic who live by a plant-based diet[47]. With the aid of media coverage, individual efforts have the potential to influence a large population and thus produce a large contribution to fighting climate change[26].

Role of the Health Care System

Improving air quality and combating air pollution is part of several SDGs, including goal 13 regarding climate action. Health insurers are a major stakeholder in this as 7 million people die prematurely every year due to air pollution. The majority of these deaths are due to ischaemic heart disease, pneumonia, stroke, COPD and lung cancer[48]. Lacey et al. show that a global phasing out of solid-fuel cook stoves over the course of the next twenty years could avoid 260,000 premature deaths per year from air pollution as well as reduce global warming by 0.08 °C by 2050[49], suggesting that health insurers have a responsibility in contributing to combating climate change.

Implications for SDG 13

As this case study highlights, there are many stakeholders in the Austrian tobacco legislation. But, as we also mentioned, tobacco policy is moving forward. Recent political turmoil in Austria has resulted in the dismissal of the Government and installation of a transitional government. This transitional government has made the decision to finalise the legislation banning indoor smoking, and as of November 1st 2019 it has come into effect. This is as a result of shared efforts of the State, the general public, NGOs, health professionals and the WHO through the FCTC.

Undoubtedly, this process could have been accelerated with improved intersectional collaboration, especially regarding NGOs and the State. Errors in process are easy to identify. However, it would be remiss not to also contemplate the significant contribution that low level IC played in the eventual successful implementation of tobacco policy. Whilst at time, functionally independent communication was the essence of any IC, over time it developed and progressed along the Howarth continuum. Perhaps with the actions of those like Greta Thunberg we are witnessing the emergence of a similar nascent stage of development of global IC.

Contrasting approaches to SDG 3 – intersectoral collaboration across the continuum

The goal of SDG 3 is to "ensure healthy lives and promote wellbeing at all ages"[50]. It is further divided into 13 targets, as outlined in Table 2.

3.1	By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births
3.2	By 2030, end preventable deaths of new-borns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births
3.3	By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases
3.4	By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being
3.5	Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol
3.6	By 2020, halve the number of global deaths and injuries from road traffic accidents
3.7	By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes
3.8	Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all
3.9	By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

3.A	Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate
3.B	Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all
3.C	Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States
3.D	Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks

Table 2: SDG 3 targets[50]

Case study 2

MPOWER: a cornerstone of the FCTC

In order to establish the targets required by the FCTC, the WHO developed a specific framework called MPOWER, which is based on monitoring tobacco use and prevention policies in order to implement different intersectoral measures to decrease tobacco use and increase healthy lives[51]. Whilst the MPOWER method has led to progress in tobacco control[52], it is important to understand whether similar intersectoral systems are being used within the realm of other health crises, such as infectious diseases, in order to meet the aims set in the SDGs. By investigating different policies implemented to address the HIV epidemic, this case study will explore how monitoring policies can help increase access to antiretroviral therapies (ART), helping to ensure healthy lives and well-being for all, as advocated by SDG 3.

MPOWER as a framework for high level collaboration

Following Article 20 of the FCTC, the WHO established an intersectoral system called MPOWER, as outlined in Table 3, to help reduce tobacco use by implementing policies in different fields, such as media, taxation, and public health measures[51].

Monitor	**Monitor tobacco use and prevention policies**
Protect	Protect people from tobacco smoke
Offer	Offer help to quit tobacco usage
Warn	Warn about the dangers of tobacco
Enforce	Enforce bans on tobacco advertising, promotions and sponsorships
Raise	Raise taxes on tobacco

Table 3: The MPOWER framework[51]

Whilst MPOWER targets tobacco control in many different sectors, each of the policies depends on the monitoring measure at the centre of MPOWER. Indeed, the framework is based on surveillance of the magnitude, patterns, determinants and consequences of tobacco consumption and exposure to tobacco smoke[51]. Through the integration of national and international programmes (high level collaboration), the MPOWER model aims to compare and analyse data on tobacco regulation at a regional and global level. The WHO recognises monitoring as a critical tobacco control activity because only through accurate measurement can problems caused by tobacco be understood and interventions be effectively managed and improved. [51] Thanks to the surveillance derived from Global Adult Tobacco Surveys and initiatives such as the Global Tobacco Surveillance System Data and the Bloomberg Initiative, the MPOWER model is increasing dedicated interventions both nationally and internationally. This model "helps countries design and carry out policy, particularly in developing countries where the tobacco industry actively seeks new markets"[52].

Since its implementation in 2008, MPOWER has had a substantial impact on tobacco prevention and control. For example, 7.4 million premature deaths will be averted due to the MPOWER measures being adopted from 2007 to 2010. Furthermore, 530 million people are now living in countries with the recommended minimum tobacco measure[52]. Whilst these are simply two of the impactful figures demonstrating MPOWER's utility in the tobacco crisis,

every aspect of the MPOWER model has progressed[53]. As reported in the latest world report on tobacco control undertaken in 2019, significant progress has been made especially in low- and middle-income countries. For example, 61% of the population living in low- and middle-income countries are protected by at least one complete MPOWER measure, and 44% by at least two MPOWER measures[52].

MPOWER and HIV prevention

The sustained success of the MPOWER model has shown that MPOWER measures and global initiatives are efficient in tackling NCD risk factors. However, whilst the incredible successes of the FCTC and MPOWER demonstrate efficacy within NCDs, it is necessary to understand whether similar measures could be implemented within diseases targeted by the third SDG. One of the elements central to this SDG is infectious diseases, with a specific focus on the HIV epidemic. The UNDP states that by the end of 2017, 21.7 million people living with HIV were receiving antiretroviral therapy, but more than 15 million people are still waiting for treatment[54]. Whilst the progress in assessing HIV patients and providing ART therapies continues to make admirable progress year by year, there are still millions of people worldwide not receiving life-saving treatment[54]. Therefore, whilst the MPOWER measures are adept at addressing NCDs, it is worthwhile contemplating whether this framework could be used for helping to accelerate access to life-saving treatments.

90-90-90: meeting targets by 2020

Recently, efforts to end the HIV epidemic have been driven by UNAIDS' 90-90-90, an HIV narrative aiming to hit targets by 2020. The 90-90-90 proposal, which was established in 2015, intends to reach three important targets[55]:

1. By 2020, 90% of all people living with HIV will know their HIV status.
2. By 2020, 90% of all people with a diagnosed HIV infection will receive sustained antiretroviral therapy.
3. By 2020, 90% of all people receiving antiretroviral therapy will have viral suppression.

However, just a few months shy of the start of 2020, these targets have not yet been met. According to the latest statistics from UNAIDS, in 2018, 79% of people living with HIV knew their status and 62% of all people living with HIV were accessing antiretroviral treatment[56]. These numbers are striking; whilst 7.7 million more people are accessing antiretroviral treatment compared to 2010, there is a nearly 30% difference between the current number of individuals accessing treatment and the 2020 targets established by UNAIDS.

Barriers to ART: health-system and population level

A 2008 review[57] investigated barriers to accessing antiretroviral treatment and recognised two types of barriers: health system-level barriers and population level barriers. Health system-level barriers are identified as a lack of human resources, infrastructure, equipment and materials used in providing treatment. Population-level barriers are considered as a lack of awareness about ART, stigma, and lack of financial means. Of 19 studies analysed in their review, 9 studies individuated both health-system and population-based barriers, whilst the rest of the studies identified either population-based barriers or health-system based barriers. One of the main challenges identified by the population-based barriers was the stigma associated by HIV. In fact, this seems to be one of the driving factors in HIV patients' decisions not to pursue treatment, especially in middle- and low-income countries.

Stigma against people living with HIV (PLHIV): a central barrier

Whilst this study was conducted in 2008 and therefore is unlikely to represent the current situation, a 2016 UNAIDS report on AIDS highlighted stigma as a central barrier preventing access to ART. Whilst research suggested discriminatory attitudes towards individuals suffering from HIV has slowly declined, discrimination against HIV is still fervent[58]. As of 2016, a report undertaken by the HIV Justice Network discovered more countries had implemented HIV criminalisation: a total of 72 countries have adopted laws allowing for HIV criminalisation, based on either HIV-specific laws or laws including HIV as one of the criminalised diseases[59]. In addition to discriminatory laws against individuals affected with HIV, population-based surveys suggest that discriminatory attitudes are still present. For example, over 50% of individuals aged 15-49 in half of the countries investigated between 2009 and 2014 reported that they would not buy vegetables from a shop owner diagnosed with HIV[58].

People Living with HIV Stigma Index

One of the most important measures developed in order to track HIV stigma and discrimination against people living with HIV is the People Living with HIV Stigma Index, a measurement tool designed to understand stigma and target universal access to ART. The People Living with HIV Stigma Index is a survey resulted from the partnership of the Global Network of People Living with HIV, the International Community of Women living with HIV and the International Planned Parenthood Federation in order to increase greater involvement of people living with HIV in research[60]. The inclusion of HIV patients and the community within the research is, in fact, central to previous findings as community involvement provides "improved education of the individual and the community at large on the benefits of treatment"[57].

To date, a key resource to come from the PLHIV Index is a study investigating stigma and discrimination in the Pacific region. The evidence gathered through the project uncovered many factors that had not yet been reported[61]. For example, one of the main aspects emphasised by the study is the high percentage of self-stigma in PLHIV; 70% of respondents described having felt shame, guilt and self-blame, with 22% admitting they had had suicidal feelings. However, the high percentage of self-stigma did not only impact personal feelings, but their access to social activities and health services, as they often excluded themselves from healthcare and, therefore, vital treatments. Another important aspect highlighted by the research is the lack of knowledge concerning undetectable viral load. In fact, nearly 41% of the respondents decided not to get married, 47% decided not to have intercourse, and 50% decided not to have children.

In addition to self-stigma and lack of knowledge concerning HIV, the study reported participant's experience of verbal insults, harassment and threats in the previous 12 months. The study highlighted an increasing need for public awareness and current knowledge of HIV and STIs within middle- and low-income countries in order to decrease stigma and discrimination, which will consequently increase access to treatment and help save lives. In addition to the importance of increasing public health measures to decrease stigma, the study also revealed the importance of having PLHIV as part of the design and conduct of the

research because "it is not only empowering but will also lead to more effective programming"[61]. In fact, PHLIV conducting the research facilitate access to participants due to their personal experience of living with HIV. For example, many participants indicated that they had never met another person living with HIV. Besides their desire to participate because of the researchers' status as having HIV, the collaboration with the interviewers led to the participants' desire to be more public about their status, which will then lead to increase awareness and decreased stigma[61].

Parallels between the PLHIV Stigma Index and MPOWER

The People Living with HIV Stigma Index is a monitoring system that targets stigma through research undertaken by PLHIV, whilst creating public health measures to decrease discrimination, increase HIV awareness, and therefore escalate access to ART treatment. Just as the MPOWER model is at the basis of tobacco control in order to meet the targets of the FCTC, the PLHIV Stigma Index aims to monitor stigma in order to create dedicated measures at a national and international level to reach the targets established by UNAIDS' 90-90-90 aims. Whilst tobacco control and monitoring of other NCD's risk factors can be undertaken through population and government-based surveys, the impact of stigma and discrimination against HIV and other STIs can be only undertaken through the help and implementation of PLHIV in active research.

Implications for SDG 3

The inclusion of PLHIV within the organisational structures, combined with their leading of research and data collection in a coordinated collaborative effort signifies more than just patient involvement. Crucially, it also increased awareness of HIV. As evidenced by the Fiji Network Plus' study, the involvement of HIV patients within data collection can decrease self-stigma caused by HIV status, therefore creating accurate knowledge of the infection and increase access to ART. This intersectoral approach has demonstrated that HIV knowledge is at the centre of the epidemic itself: without contact between HIV patients and the community, stigma will continue to pervade through middle- and low- income countries and the HIV epidemic will continue to spread. Through the connection of HIV patients, unknown perspectives can be researched, further awareness can develop, and stigma can decrease,

therefore leading to increased access to ART, helping to end the HIV epidemic and therefore, meeting a vital goal in SDG 3.

Case study 3

Diabetes and a disease centric approach

Diabetes is a chronic non-communicable disease (NCD) that occurs when the body is unable to produce or regulate insulin. It occurs in both children and adults, though can also develop during pregnancy. Type 1 diabetes, which occurs when the body is unable to produce insulin, is mainly prevalent in children, whilst type 2 is more common in adults with a history of obesity and physical inactivity[62]. Both types eventually result in complications related to the heart, kidneys, nervous system, eyes and circulatory system.

According to WHO statistics, 422 million adults were diagnosed with diabetes in 2014 with 1.6 million deaths in 2016[63,64]; more recent figures specific to the UK show nearly 42 million adults have been affected, with an estimated 1 million already suffering from type 2 diabetes but not yet been diagnosed[65]. The sheer number of individuals affected, coupled with the complications that arise from it, render diabetes as a priority NCD to be addressed. Prevention and effective treatment of this disease would therefore directly contribute to achieving SDG goal 3.4., which aims to 'reduce by one third premature mortality from non-communicable diseases by 2030 through prevention and treatment and promote mental health and well-being'[66].

The economic impact of diabetes cannot be ignored as it places a huge burden on public health systems and also affects the ability of people to work[67–69]. Moreover, due to the nature of the disease, access to medicines, such as insulin and supporting drugs to lower cholesterol levels, and managing arising complications, such as retinopathy and cardiovascular diseases, are crucial to reducing mortality and improving quality of life[70–74]. This lack of availability is further exacerbated in low and middle-income countries (LMICs) due to a lack of effective governmental policies, insufficient spending power and lack of coordination among various stakeholders[75–78]. Therefore, not addressing diabetes also undermines the overall progress

made on SDG 1 ('No poverty')[79], SDG 8 ('Decent Work and Economic Growth')[80] and SDG 10 ('Reduced Inequalities')[81].

An intersectoral action plan

In order to combat this growing issue, the WHO has rolled out the WHO NCD Global Action Plan 2013–2020[82] which offers a number of high-level recommendations to national governments to improve their response towards the increasing prevalence of diabetes. Amongst other recommendations to engage in capacity building and filling knowledge gaps, it highlights the importance of a "multisectoral approach"'[82]. This is particularly relevant for type 2 diabetes, which is preventable in contrast with type 1, and which will be the focus of the case study presented in this section. It has been reported that 88% of countries already have a policy related to tackling diabetes, whilst only 77% have dedicated funding for its implementation[63,83]. Despite having these policies in place, a study focusing on European diabetes policy noted that there is still a lack of multisectoral collaboration; for example, only 9 out of 44 countries in Europe actively funded prevention measures[84], although these are required to reduce the incidence of the disease.

In the following section, we present a case study from the UK, to showcase how these multisectoral collaborations can effectively help combat diabetes, and in effect, promote the advancement of the SDGs.

Addressing Diabetes in England through Social Prescribing

Social prescribing is an approach that has been pioneered by the National Health Service in England, whereby it is "a mechanism for linking patients with non-medical sources within the community"[85,86]. It recognises that patients benefit from these behavioural interventions and support mechanisms in addition to medical prescriptions, effectively endorsing a "multisectoral approach". This model can range from signposting patients to the relevant community organisations to developing a comprehensive strategy with non-medical stakeholders to develop local interventions[87].

The argument for social prescribing arises from the already existing pressures on primary care resources, which means that patients with long-term conditions might need the assistance of voluntary organisations or community schemes to better manage their diseases[88,89]. This model of treatment also shifts the focus away from illness to wellness, thereby also advancing SDG 3, which "ensures healthy lives and promotes well-being for all at all ages". Initial studies have shown that social prescribing has generally increased patient wellbeing, although further work needs to be done to improve the cost-effectiveness and potential to reduce usage levels of primary care resources[90,91]; however, more robust studies are required in order to draw concrete conclusions[92].

Two types of social prescribing in specific, UK-based programmes are worthy of further commentary, both of which are used for management of chronic diseases, and can therefore be extended to the control of Type 2 diabetes.

Ways to Wellness: Intersectoral collaboration and the management of chronic disease

About the service

Ways to Wellness is a charitable organisation which aims to link service providers with clinical commissioning groups (CCGs). It is funded by the Department of Health, the Cabinet Office voluntary organisations and a venture fund[93] and was founded through a multisectoral collaboration amongst the Voluntary Organisations' Network North East (VONNE), the Newcastle West CCG and the Association of Chief Executives of Voluntary Organisations (ACEVO)[94]. The area of Newcastle was chosen particularly due to the prevalence of deprivation in the region, which is thought to lead to poorer health outcomes especially in the context of long-term conditions. The programme is currently scheduled to run for 7 years from 2015 to 2022[95].

Objective and Methods

The service is mainly used to cater to those patients aged 40-74 with a long-term condition, one of which is diabetes. It operates on a referral system from the patient's GP or practice nurse and is centred around interaction with a 'link worker' from the service provider. This link worker is highly trained in behaviour management and works together with the patient

to create a personalised action plan. Depending on the intervention needed, this may include developing nutrition and fitness plans or assisting in accessing specialist services[93–95].
The objective of the service is to ultimately ensure that the patient is able to self-manage their condition, whilst also reducing the need to access the NHS, either in primary or secondary care settings. An indirect consequence of such a social prescribing programme is also expected to be that of reducing health inequalities by focusing on "person-centred" care[95].

Efficacy to date

This is an ongoing programme, but interim studies have shown that patients report a significant improvement in their wellbeing, particularly with regard to work and volunteering activities[95]; these outcomes are directly related to SDGs 1, 2 and 8. The multisectoral approach also seems to have worked as the service has reported around 4000 referrals from GP practices to the service as of 2018, indicating buy-in from the medical stakeholders[95]. However, the service has not been without challenges, one of which is the inflexibility of current NHS contracts towards such innovative approaches indicating that at a policy level, more needs to be done. It is also interesting to note that the service is facing hurdles in attracting new funders, particularly due to the nature of the public sector-voluntary sector collaboration[94,95].

Upon observing the patient experience at a granular level, qualitative evidence published in the BMJ Open[96] showed that the programme had been preliminarily effective in treating those conditions which required a more extensive approach than was offered in a primary care setting. Although this study involved patients with diabetes as well as other long-term conditions, 86.6% of them received some referral to physical activity and weight management services. Particularly, those with diabetes noted an increase in feeling in control of their condition due to directly observable physical effects such as reduction in cholesterol levels[96].

A detailed evaluation of this programme in relation to type-2 diabetic patients is slated to be conducted in 2019. The protocol of this evaluation describes that primary outcomes such as Hb1Ac levels and secondary outcomes such as systolic blood pressure, cholesterol levels, usage of secondary care will be measured in groups of individuals enrolled in the programme

versus control groups[97]. A thorough analysis of the cost-effectiveness of such a social prescribing programme in the context of diabetes will also be studied, as will the variation in effectiveness of interventions among different people. The outcomes of this study will be instrumental in informing governments of both 'best practices' and 'lessons learnt' and will therefore offer a solid framework for the development of the social prescribing model in managing type 2 diabetes.

Exercise on Referral: Intersectoral collaboration and the prevention of chronic disease

About the service

Exercise on Referral Scheme (ERS) is a social prescribing scheme run in partnership with Clinical Commissioning Groups (CCGs) and local gyms/leisure centres[98]. It mainly focuses on increasing uptake of physical activity, and therefore is highly relevant to the prevention of type 2 diabetes. These schemes have been running in the UK since the 90s[99], and have been used extensively since then[100].

Objective and Methods

The scheme generally runs for 12-15 weeks and incorporates efforts from GPs, rehabilitation and nursing specialists. These schemes run throughout the country and some examples include schemes in Hertfordshire, Cumbria and London[101–103]. Patients are allowed to access the gym for free or for a highly subsidised amount for the duration of the course; some schemes also offered support and advice to sustain levels of physical activity post the course.

The objective of the scheme was to evaluate if increased physical activity reduced any symptoms and helped better manage long-term conditions. Enrolling an individual on an ERS scheme costed on average £169[104]; however the healthcare expenditure on diabetic patients is nearly three times when compared to those without the condition[105]. Therefore, this measure was also seen as one that could reduce costs incurred by the NHS.

Efficacy to date

Multiple randomised controlled trials (RCTs) have been conducted to observe the effectiveness of ERSs, with similar conclusions[106–109]. A study conducted in London[110] focused

on participants who were referred to leisure centres, community-based supervised walking groups and also a number of 'control' participants who were only provided advice on physical activity. The programme lasted for 10 weeks and participants were evaluated after 6 months. It was observed that all those who took part, including the control group, achieved increased levels of physical activity and as a consequence, had improved health outcomes. However, from a cost-effectiveness perspective, providing tailored advice to participants appeared to be the most desirable option. This view was further corroborated by another study conducted in 2005[106], which observed only a marginal difference in physical activity after 12 months between groups who were referred to an ERS and those who were not. Despite the evidence above, the usage of ERSs to improve health outcomes in the specific context of diabetes has not been explored[111]; previous studies have solely focused on an uptake of physical activity and continued adherence. Therefore, this is an area that can be built upon by public health authorities in collaboration with local councils and CCGs.

Implications for SDGs 3 & 10

Addressing diabetes through intersectoral approaches would directly contribute to the fulfilment of target 3.4 of SDG 3, which looks to decrease premature mortality rates by 33.33% by 2030. This would not only reduce the disease burden on public health systems, but also improve general quality of life in populations. Moreover, effectively managing and by extension, preventing chronic NCDs such as diabetes, will ensure more people are healthy enough to engage in education and work; these are key drivers to reducing social inequalities and are therefore central to achieving progress towards SDG 10.

Summary of Key Findings

In this report we have demonstrated the innately flexible and adaptable nature of intersectoral collaboration. It is, indeed, a concept that has many guises ranging from high level integration, right down to grass roots initiatives. In turn, it is applicable to a very wide variety of societal, humanitarian and health issues. In this respect, conceptually, IC aligns perfectly with the SDGs. If the SDGs are, by design, ambitious and integrated, complex and discerning, then it is challenging to see how anything other than a truly holistic, intersectional approach can posit any chance of successfully realising them.

When utilised effectively and with appropriate motivation, IC can be a source of great improvement and change. This is true whether it be in the form of low level, agency-based integration where autonomous individuals communicate with one another to mobilise and form a moment, to a high level, fully integrated collaboration-focussed initiative where new international regulatory organisations are created. And, of course, everything in between. Although a brief summary of the IC spectrum, the continuum as presented by Horwath et al.[12] also describes the diversity of our case studies:

Case study 1

A few children and adolescents messaging over social media can transform into a social movement as with Greta Thunberg; or a petition can contribute to politicians finally realising the need to eradicate indoor smoking in a developed country.

Case study 2

On the other hand, the establishment of a worldwide convention can lead to the radical overhaul of tobacco control, and perhaps provide the key to removing the stigma that prevents millions from accessing antiretroviral drugs.

Case study 3

Or a combination of the two can empower patients and patient advocates alike to prevent, or improve the treatment of, chronic disease and in doing so provide an example of how government policy can be enacted at a local level.

Yet, whilst this is an overwhelmingly positive and empowering message, some degree of caution should be heeded. Indeed, as the Austrian example demonstrates, IC can also be utilised effectively by those seeking to obstruct and resist change. Conflict of interest clearly needs to be managed, but so too do more complex societal constructs such as stigma and a lack of compliance with interventions.

All things considered, our research confirmed the potential for intersectoral collaboration to be a transformative tool in the march towards the goals and targets of the SDGs.

Conclusions

Intersectoral collaboration is a malleable, multipurpose tool that aligns perfectly with the explicit goals and objectives of the SDGs. Collaboration can occur across a spectrum, with different models suited to different targets. In order to identify the optimal form of IC, a critical approach can be applied to past examples to provide a framework moving forward.

References

1. United Nations. Transforming Our World: The 2030 Agenda for Sustainable Development. in (2015). doi:10.1891/9780826190123.ap02.
2. Communications materials - United Nations Sustainable Development. https://www.un.org/sustainabledevelopment/news/communications-material/.
3. Nugent, R. *et al.* Investing in non-communicable disease prevention and management to advance the Sustainable Development Goals. *The Lancet* vol. 391 2029–2035 (2018).
4. Nilsson, M. *et al.* Mapping interactions between the sustainable development goals: lessons learned and ways forward. *Sustain. Sci.* **13**, 1489–1503 (2018).
5. Sen, S. & Ganguly, S. Opportunities, barriers and issues with renewable energy development – A discussion. *Renewable and Sustainable Energy Reviews* vol. 69 1170–1181 (2017).
6. Nilsson, M., Griggs, D. & Visbeck, M. Policy: Map the interactions between Sustainable Development Goals. *Nature* vol. 534 320–322 (2016).
7. Gupta, J. & Vegelin, C. Sustainable development goals and inclusive development. *Int. Environ. Agreements Polit. Law Econ.* **16**, 433–448 (2016).
8. Kumi, E., Arhin, A. A. & Yeboah, T. Can post-2015 sustainable development goals survive neoliberalism? A critical examination of the sustainable development-neoliberalism nexus in developing countries. *Environ. Dev. Sustain.* **16**, 539–554 (2014).
9. Reaching the furthest behind first is the answer to leaving no one behind | UN DESA | United Nations Department of Economic and Social Affairs. https://www.un.org/development/desa/en/news/sustainable/reaching-furthest-behind.html.
10. United Nations Committee for Development Policy. Why leaving no one behind matters. **13**, 55–64 (2018).
11. Tooher, R. *et al.* Intersectoral collaboration to implement schoolbased health programmes: Australian perspectives. *Health Promot. Int.* **32**, 312–321 (2017).
12. Horwath, J. & Morrison, T. Collaboration, integration and change in children's services: Critical issues and key ingredients. *Child Abus. Negl.* **31**, 55–69 (2007).

13. Axelsson, R. & Axelsson, S. B. Integration and collaboration in public health - A conceptual framework. *Int. J. Health Plann. Manage.* **21**, 75–88 (2006).
14. Shigayeva, A., Atun, R., McKee, M. & Coker, R. Health systems, communicable diseases and integration. *Health Policy Plan.* **25**, i4–i20 (2010).
15. Kang, E. Intersectoral collaboration for physical activity in Korean Healthy Cities. *Health Promot. Int.* **31**, 551–561 (2016).
16. Herdiana, H., Sari, J. F. K. & Whittaker, M. Intersectoral collaboration for the prevention and control of vector borne diseases to support the implementation of a global strategy: A systematic review. *PLoS One* **13**, (2018).
17. Ndumbe-Eyoh, S. & Moffatt, H. Intersectoral action for health equity: A rapid systematic review. *BMC Public Health* **13**, (2013).
18. Chircop, A., Bassett, R. & Taylor, E. Evidence on how to practice intersectoral collaboration for health equity: a scoping review. *Crit. Public Health* **25**, 178–191 (2015).
19. Public Health Agency of Canada & World Health Organization. *Health Equity Through Intersectoral Action: An Analysis of 18 Country Case Studies*. *Health Equity through Intersectoral Action: An Analysis of 18 Country Case Studies* (2008).
20. Delaney, F. G. Muddling through the middle ground: Theoretical concerns in intersectoral collaboration and health promotion. *Health Promot. Int.* **9**, 217–225 (1994).
21. WHO. Sustainable Development Goal 13. https://sustainabledevelopment.un.org/sdg13.
22. Kendrovski, V. & Schmoll, O. Priorities for protecting health from climate change in the WHO European Region: recent regional activities. *Bundesgesundheitsblatt - Gesundheitsforsch. - Gesundheitsschutz* **62**, 537–545 (2019).
23. Roberts, M. Summer heatwave 'death spike' seen in UK. *BBC News Onlines* (2019).
24. Cowan, J. Are Wildfires Caused by Utilities or Climate Change? Yes. *The New York Times* (2019).
25. Tollefson, J. Canadian kids sue government over climate change. (2019).
26. Rowlatt, J. Climate change action: We can't all be Greta, but your choices have a ripple effect. (2019).
27. Tobacco Key Facts. https://www.who.int/en/news-room/fact-sheets/detail/tobacco

(2019).

28. World Health Organization. *WHO Framework Convention on Tobacco Control*. (2005).
29. Machleidt, S. Umfassender Nichtraucherschutz als gesellschaftliche Verantwortung. *Medical University of Vienna* (2013).
30. Neuberger, M., Moshammer, H. & Schietz, A. Exposure to ultrafine particles in hospitality venues with partial smoking bans. *J. Expo. Sci. Environ. Epidemiol.* **23**, 519–524 (2013).
31. U.S. Department of Health and Human Services. LET'S MAKE THE NEXT GENERATION TOBACCO-FREE: Your Guide to the 50th Anniversary Surgeon General ' s. (2014).
32. Stafford, N. Austrian doctors secure potential reprieve for scrapped smoking ban. *BMJ (Clinical research ed.)* (2018) doi:10.1136/bmj.k1912.
33. Neuberger, M. Failure of Tobacco Control in Central Europe. *Occup. Med. Heal. Aff.* **1**, 1–2 (2013).
34. The Gallup Organisation. *Survey on Tobacco. Analytical report*. *Flash Eurobarmeter* http://ec.europa.eu/public_opinion/flash/fl_253_en.pdf (2009).
35. Wirtschaftskammer Oesterreich. Rauchverbot ab 01.11.2019. https://www.wko.at/branchen/tourismus-freizeitwirtschaft/hotellerie/rauchverbot-ab-01-11-2019.html (2019).
36. Medicine, T. Consensus and Complacency . The Failure of Tobacco Control in Austria. (2004).
37. Binding, L. *Kalter Rauch – Der Anfang vom Ende der Kippenrepublik*. (2008).
38. Staudigl, D. Rauchen und Recht. *Medical University of Vienna* (2009).
39. Kirnbauer, A. C. Aktiv- und Passivrauchen , Belästigung , Risikobewusstsein und Gesetzesakzeptanz bei Lokalinhabern und Angestellten in der Wiener Gastronomie im Vergleich zu Gästen. *Medical University of Vienna*.
40. Wunsch, N.-G. Retail price of premium cigarettes in Europe 2017, by country. https://www.statista.com/statistics/415034/cigarette-prices-across-europe/ (2019).
41. Don't Smoke. https://dontsmoke.at/ (2019).
42. Taylor, M. & Watts, J. Revealed: the 20 firms behind a third of all carbon emissions. *The Guardian* (2019).
43. Wiener Linien. Semesterkarte. https://www.wienerlinien.at/eportal3/ep/channelView.do/pageTypeId/66526/chann

elId/-47241.

44. Laufer, N. & Stefan, L. Was für und was gegen eine CO2-Steuer in Österreich spricht. *Der Standard* (2019).
45. TED. Greta Thurnberg. https://www.ted.com/speakers/greta_thunberg.
46. Sengupta, S. Protesting Climate Change, Young People Take to Streets in a Global Strike. *New York Times* (2019).
47. Springmann, M., Godfray, H. C. J., Rayner, M. & Scarborough, P. Analysis and valuation of the health and climate change cobenefits of dietary change. *Proc. Natl. Acad. Sci. U. S. A.* **113**, 4146–4151 (2016).
48. WHO. Air Pollution Infographics. https://www.who.int/airpollution/infographics/en/.
49. Lacey, F. G., Henze, D. K., Lee, C. J., Van Donkelaar, A. & Martin, R. V. Transient climate and ambient health impacts due to national solid fuel cookstove emissions. *Proc. Natl. Acad. Sci. U. S. A.* **114**, 1269–1274 (2017).
50. WHO | SDG 3: Ensure healthy lives and promote wellbeing for all at all ages. *WHO* (2017).
51. WHO. *Monitor tobacco use and prevention policies*. www.who.int/tobacco/mpower/publications.
52. WHO. *Mpower in action*. http://www.who.int/tobacco/mpower/publications/mpower_2013.pdf?ua=1 (2013).
53. WHO | WHO report on the global tobacco epidemic 2013. *WHO* (2016).
54. Goal 3: Good health and well-being | UNDP. https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-3-good-health-and-well-being.html.
55. UNAIDS. *90-90-90 An ambitious treatment target to help end the AIDS epidemic*. (2014).
56. *2018 GLOBAL HIV STATISTICS*.
57. Posse, M., Meheus, F., Van Asten, H., Van Der Ven, A. & Baltussen, R. Barriers to access to antiretroviral treatment in developing countries: A review. *Tropical Medicine and International Health* vol. 13 904–913 (2008).
58. UNAIDS. *Global AIDS Update 2016*. (2016).
59. Bernard, E. & Cameron, S. *Building momentum in global advocacy against HIV criminalisation*. www.hivjustice.net (2016).

60. People Living with HIV Stigma Index | UNAIDS. https://www.unaids.org/en/resources/presscentre/featurestories/2008/august/20080826stigmaindex.

61. Fiji Network Plus. *Overview Report of the People Living with HIV Stigma Index Study in Seven Countries in the Pacific*. www.stigmaindex.org. (2018).

62. Roglic, G. WHO Global report on diabetes: A summary. *Int. J. Non-Communicable Dis.* **1**, 3–8 (2016).

63. WHO. *Global Report on Diabetes*. *World Health Organization* http://www.who.int/about/licensing/copyright_form/index.html%0Ahttp://www.who.int/about/licensing/ (2016).

64. WHO. Diabetes Fact Sheet. *30 October 2018* 5 (2018).

65. Diabetes UK. *Us, diabetes and a lot of facts and stats*. (2019).

66. United Nations. Sustainable Development Goals: Goal 3. https://www.un.org/sustainabledevelopment/health/.

67. Seuring, T., Archangelidi, O. & Suhrcke, M. The Economic Costs of Type 2 Diabetes: A Global Systematic Review. *Pharmacoeconomics* **33**, 811–831 (2015).

68. Jönsson, B. Revealing the cost of Type II diabetes in Europe. *Diabetologia* **45**, (2002).

69. Bilandzic, A. & Rosella, L. The cost of diabetes in Canada over 10 years: Applying attributable health care costs to a diabetes incidence prediction model. *Heal. Promot. Chronic Dis. Prev. Canada* **37**, 49–53 (2017).

70. Gakidou, E. *et al.* Management of diabetes and associated cardiovascular risk factors in seven countries: A comparison of data from national health examination surveys. *Bull. World Health Organ.* **89**, 172–183 (2011).

71. Sarwar, N. *et al.* Diabetes mellitus, fasting blood glucose concentration, and risk of vascular disease: A collaborative meta-analysis of 102 prospective studies. *Lancet* **375**, 2215–2222 (2010).

72. Barengo, N. C., Katoh, S., Moltchanov, V., Tajima, N. & Tuomilehto, J. The diabetes-cardiovascular risk paradox: Results from a Finnish population-based prospective study. *Eur. Heart J.* **29**, 1889–1895 (2008).

73. Fong, D. S. *et al.* Retinopathy in Diabetes. *Diabetes Care* **27**, S84–S87 (2004).

74. Middleton, R. J. *et al.* The unrecognized prevalence of chronic kidney disease in diabetes. *Nephrol. Dial. Transplant.* **21**, 88–92 (2006).

75. Smith-Spangler, C. M., Bhattacharya, J. & Goldhaber-Fiebert, J. D. Diabetes, its treatment, and catastrophic medical spending in 35 developing countries. *Diabetes Care* **35**, 319–326 (2012).

76. Kirigia, J. M., Sambo, H. B., Sambo, L. G. & Barry, S. P. Economic burden of diabetes mellitus in the WHO African region. *BMC Int. Health Hum. Rights* **9**, 1–12 (2009).

77. Beran, D., Yudkin, J. S. & De Courten, M. Access to care for patients with insulin-requiring diabetes in developing countries: Case studies of Mozambique and Zambia. *Diabetes Care* **28**, 2136–2140 (2005).

78. Narayan, K. M. V. *et al.* How should developing countries manage diabetes? *CMAJ* **175**, 733–736 (2006).

79. United Nations. Sustainable Development Goals: Goal 1. *United Nations* https://www.un.org/sustainabledevelopment/poverty/.

80. United Nations. Sustainable Development Goals: Goal 8. https://www.un.org/sustainabledevelopment/economic-growth/.

81. United Nations. Sustainable Development Goals: Goal 10. https://www.un.org/sustainabledevelopment/inequality/.

82. World Health Organization (WHO). Global Action Plan for the Prevention and Control of NCDs 2013-2020. *Who* 55 (2013).

83. World Health Organization. *Non-Communicable Diseases Progress Monitor 2015*. (2015).

84. Felton, A.-M. & Hall, M. Diabetes in Europe policy puzzle: the state we are in. *Int. Diabetes Nurs.* **12**, 3–7 (2015).

85. Drinkwater, C., Wildman, J. & Moffatt, S. Social prescribing. *BMJ* **364**, 1–5 (2019).

86. NHS England. *Social prescribing and community-based support: Summary guide*. https://www.england.nhs.uk/publication/social-prescribing-and-community-based-support-summary-guide/ (2019).

87. Public Health England. Social prescribing: applying All Our Health. https://www.gov.uk/government/publications/social-prescribing-applying-all-our-health/social-prescribing-applying-all-our-health#fn:1 (2019).

88. Simmons, D., English, P., Robins, P., Craig, A. & Addicott, R. Should diabetes be commissioned through multidisciplinary networks, rather than practice based commissioning? *Prim. Care Diabetes* **5**, 39–44 (2011).

89. South, J., Higgins, T. J., Woodall, J. & White, S. M. Can social prescribing provide the missing link? *Prim. Heal. Care Res. Dev.* **9**, 310–318 (2008).

90. Chatterjee, H. J., Camic, P. M., Lockyer, B. & Thomson, L. J. M. Non-clinical community interventions: a systematised review of social prescribing schemes. *Arts Heal.* **10**, 97–123 (2018).

91. Loftus, A. M., McCauley, F. & McCarron, M. O. Impact of social prescribing on general practice workload and polypharmacy. *Public Health* **148**, 96–101 (2017).

92. Bickerdike, L., Booth, A., Wilson, P. M., Farley, K. & Wright, K. Social prescribing: Less rhetoric and more reality. A systematic review of the evidence. *BMJ Open* **7**, (2017).

93. Ways to Wellness. Ways to Wellness. https://waystowellness.org.uk/.

94. Case, T. *The Development of Ways to Wellness*. (2018).

95. Public Health England. Ways to Wellness Newcastle for people with long term conditions. https://www.gov.uk/government/case-studies/ways-to-wellness-newcastle-for-people-with-long-term-conditions (2018).

96. Moffatt, S., Steer, M., Lawson, S., Penn, L. & O'Brien, N. Link Worker social prescribing to improve health and well-being for people with long-term conditions: Qualitative study of service user perceptions. *BMJ Open* **7**, (2017).

97. Moffatt, S. *et al.* Evaluating the impact of a community-based social prescribing intervention on people with type 2 diabetes in North East England: Mixed-methods study protocol. *BMJ Open* **9**, (2019).

98. NHS Health Education England. *Social prescribing at a glance: North West England*. https://www.hee.nhs.uk/sites/default/files/documents/ (2016).

99. Fox, K. Physical activity promotion through primary health care in England. *Br. J. Gen. Pract.* **47**, 367–369 (1997).

100. Gidlow, C., Johnston, L. H., Crone, D. & James, D. Attendance of exercise referral schemes in the UK: A systematic review. *Health Educ. J.* **64**, 168–186 (2005).

101. East and North Hertfordshire Clinical Commissioning Group. *Hertfordshire Exercise Referral Scheme*. (2019).

102. North Cumbria Clinical Commissioning Group. Exercise on Referral. http://www.northcumbriaccg.nhs.uk/news/2014/april/Exercise-on-Referral.aspx (2014).

103. Havering London Borough. *Everyone Active Exercise Referral Scheme*.

104. Anokye, N. K. *et al.* The cost-effectiveness of exercise referral schemes. *BMC Public Health* **11**, 954 (2011).

105. International Diabetes Foundation. *IDF Diabetes Atlas: 4th Edition*. *International Diabetes Federation Diabetes Atlas* (2009). doi:2-930229-80-2.

106. Harrison, R. A., Roberts, C. & Elton, P. J. Does primary care referral to an exercise programme increase physical activity 1 year later? A randomized controlled trial. *J. Public Health (Bangkok).* **27**, 25–32 (2005).

107. Morgan, O. Approaches to increase physical activity: Reviewing the evidence for exercise-referral schemes. *Public Health* **119**, 361–370 (2005).

108. Gidlow, C., Johnston, L. H., Crone, D. & James, D. Methods of Evaluation : Issues and Implications for Physical Activity Referral Schemes. *Am. J. Lifestyle Med.* **2**, 46–50 (2008).

109. Sowden, S. L. & Raine, R. Running along parallel lines: How political reality impedes the evaluation of public health interventions. A case study of exercise referral schemes in England. *J. Epidemiol. Community Health* **62**, 835–841 (2008).

110. A.J., I. *et al.* Exercise evaluation randomised trial (EXERT): A randomised trial comparing GP referral for leisure centre-based exercise, community-based walking and advice only. *Health Technol. Assess. (Rockv).* **11**, iii–104 (2007).

111. Campbell, F. *et al.* A systematic review and economic evaluation of exercise referral schemes in primary care: A short report. *Health Technol. Assess. (Rockv).* **19**, 1–110 (2015).