

Institute for Public Policy Research



# **PREVENTION IN THE AGE OF INFORMATION**

**PUBLIC EDUCATION  
FOR BETTER HEALTH**

**Dean Hochlaf and  
Harry Quilter-Pinner**

June 2020

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# SUMMARY

Tackling preventable illness must remain a top priority for the government in the 2020s. Over half of the disease burden in England is deemed preventable, with one in five deaths attributed to causes that could have been avoided. After many years of improvement, progress has stalled on reducing the number of people suffering from preventable illness. Moreover, compared to other high-income countries, we underperform on this metric.

This is not good enough, as the government has recognised in its prevention green paper and the NHS Long Term Plan. This is a welcome shift that begins to recognise the value of prevention in the health sector. Action to reduce the burden of preventable illness will pay off in terms of better health but also for our economy and public services. Prevention leads to longer and healthier lives. But it is also important because improved health drives greater wealth (in particular through higher workforce participation and productivity), makes the NHS and other public services more sustainable, and is a prerequisite of delivering social justice, given the inequalities in health present across our society. Prevention really is better than cure.

The government must deliver a paradigm shift in prevention policy from interventions that 'blame and punish' to those that 'empathise and assist'. The aim of prevention policy is to drive behaviour change: to help people make better health decisions. Policymakers have historically leant disproportionately on levers that 'blame and punish' the individual for 'bad health decisions' (such as regressive taxes and bans), rather than those that 'empathise and assist' the public to make better decisions about their health, such as eating more nutritious meals or avoiding smoking. This approach has not delivered the transformation required. We must now change our strategy.

Any new prevention strategy must take into account the new information environment that has resulted from technological advancement. The internet is increasingly the first point of call for people searching for information or advice about their health. New polling<sup>1</sup> conducted for this paper shows that three in five (61 per cent) British adults have used the internet to check symptoms or self-diagnose, while three in 10 (31 per cent) have used it to improve their lifestyle choices. Of those who have used the internet to access information and advice about health, the most trustworthy sources are considered to be the NHS website (81 per cent), charity websites such as Cancer Research UK (28 per cent) and social media (15 per cent).

In the wake of the Covid-19 crisis, a light has been shone on the valuable role in which technology can be used to promote public health and spread information. Additional polling<sup>2</sup> has shown that two in three adults would support the use of

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1 Poll conducted by Savanta ComRes; 2,008 British adults (aged 18 or over) online between 22 and 24 November 2019 were interviewed. Data were weighted to be demographically representative of adults aged 18 or over in Great Britain by age, gender, region and social grade. Savanta ComRes is a member of the British Polling Council and abides by its rules. Full data tables can be found on the Savanta ComRes website, see: <https://www.comresglobal.com/our-work/poll-archive/>

2 Poll conducted by Savanta ComRes; 2,058 British adults (aged 18 or over) online between 24 and 27 April 2020 were interviewed. Data were weighted to be demographically representative of adults aged 18 or over in Great Britain by age, gender, region and social grade. Savanta ComRes is a member of the British Polling Council and abides by its rules. Full data tables can be found on the Savanta ComRes website, see: <https://www.comresglobal.com/our-work/poll-archive/>

communication strategies such as TV advertising (78 per cent) or texting (64 per cent) to address other public health concerns once the crisis is over. Two in three (67 per cent) adults would also like to see the partnerships forged between the NHS and large tech groups to share health information continue post-Covid-19 to support public health campaigns. The crisis has also highlighted the pernicious prevalence of false information. Nearly half (48 per cent) of adults in Britain have seen or been sent what they would consider to be 'fake news' since the outbreak of the crisis. It is clear that Covid-19 has exposed the dangers of new technology as a harbinger of false, potentially dangerous information, but it is also apparent that technology can play a prominent role in appropriately informing the public and ensuring that people are alert to the public health crisis we are all facing.

This technological transformation has delivered a number of benefits. It has upended the traditional relationship between doctors and patients, and has the potential to empower individuals to take a more active role in managing their health. However, it also brings with it challenges, particularly misinformation and disinformation. The internet may have improved day-to-day access to health information, but it is neither universally trusted, nor universally reliable. Our polling shows that just five per cent of British adults rank the internet as their most trusted source of information or advice about health (compared to 75 per cent for the NHS). This is understandable: 'new technology makes the manipulation and fabrication of content simple' and falsehoods can be hugely amplified (UNESCO 2018). This is leading to a rise of both misinformation and disinformation among the public. For example, our polling shows that less than half of the population believe obesity is linked to cancer (misinformation), while over a third either agree that vaccinations can cause autism, or say they don't know (disinformation).

The government must respond to these changes with a new focus on public education for better health in the information age. Many people have called for more regulation on internet providers and online platforms to manage the information available to the public and promote better health. However, the reality is that the vastness of the internet makes it virtually impossible to regulate and control what can be accessed (particularly at an individual country level), even if we could collectively determine what was 'desirable' and 'undesirable' information. Further, the internet is a global platform and does not require proof of expertise for those using it to convey health information. Instead of greater regulation, government should pursue action to ensure that people have the knowledge, skills and motivation to access the right information, understand it and utilise it as a source of empowerment: to voice their needs and preferences about their health and to change their health behaviours. This is particularly relevant to groups such as older people, those in rural communities and those who are less confident in applying health information, who are likely to struggle either with access to digital technologies or making full use of the information available to them.

The government should pursue a number of key policy proposals to achieve this:

- **Introduce a permanent disinformation unit.** The disinformation unit established in the midst of the Coronavirus spread should be made a permanent feature of the Department of Culture, Media and Sport (DCMS) with the express aim of combatting the spread of disinformation, as well as general health misinformation, and working with other departments, tech firms and civil society, in order to help shape public health narratives and respond quickly to misinformation during public health emergencies.
- **Launch a new public information – and listening – campaign to address the issues of disinformation and misinformation.** The misinformation unit should partner with the NHS and social media sites to create a stream of tailored and relevant public health messages that help tackle gaps in the public's

knowledge and awareness of emerging public health concerns, while providing opportunities for the public to learn more about issues from accurate sources.

- **Develop the NHS app with new features designed to encourage behaviour change.** The NHS app and website are very popular, but they do not include features designed to actively support people in achieving behaviour change. A new element of the app could be designed to utilise the growing evidence on technology-enabled behaviour change and spread this to a larger number of people.
- **Invest in the capacity of schools to deliver better health education as a core part of the curriculum.** The government's recent commitment to making Relationships, Sex and Health Education (RSHE) compulsory is welcome. But health education must form a core part of this and be taken seriously by schools and pupils alike. A focus on health information and how to identify misinformation should be included.
- **Mandate the provision of one nurse (or other trained clinical staff member) per 600 school students to promote better health.** In Finland, a ratio of 1:600 between nurses and school students exists. England should legislate to match that. At present, we estimate that the ratio is 1:3,900 in England. We estimate that this would require up to 11,500 nurses, costing £445 million each year.
- **Ensure everyone exhibiting risky behaviour or with a newly diagnosed condition has access to a personal care plan, social prescribing and peer support networks.** The NHS Long Term Plan has promised to roll out 'universal personalised care', which includes these core empowerment initiatives. But the government is still some way off delivering this. It will need to invest in the third sector to make this happen.

# 1. INTRODUCTION

## A POLICY CONSENSUS: THE RETURN OF PREVENTION

The government is in the process of renewing its focus on prevention. It is one of the secretary of state for health and social care's top priorities and the previous government released a green paper on the topic (DHSC 2018). The prevention green paper echoes the sentiments expressed in the NHS Long Term Plan, which recognises prevention as an essential component for the sustainability of the National Health Service (NHS 2019a). The recent Queen's Speech confirmed that this agenda remains a priority under the new government. This growing consensus is a big opportunity to deliver a paradigm shift in preventative health policy in the UK and embed public education as a major tool for driving better health. This report begins to set out how this can be achieved.

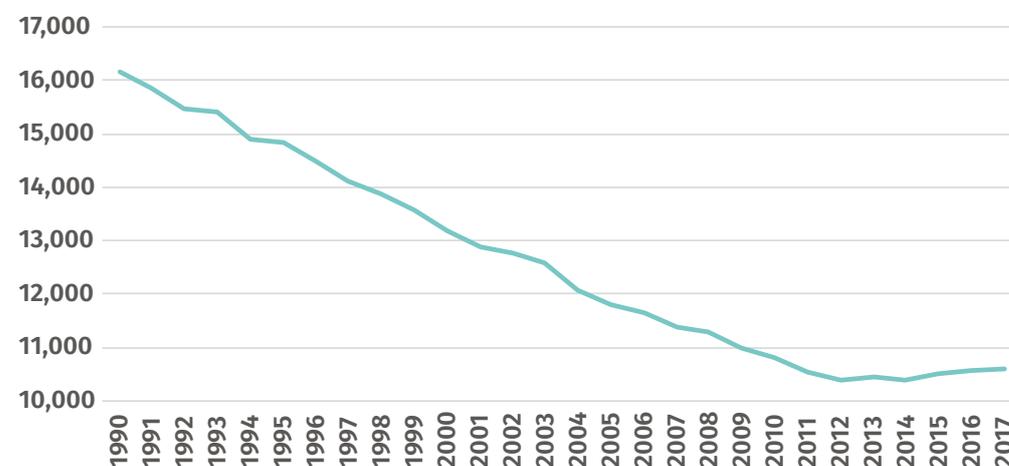
## THE CHALLENGE OF PREVENTION

Preventable disease is one of the great public health challenges we face. Over half of the disease burden in the UK today can be attributed to social, environmental or behavioural factors (McGovern et al 2014). These factors are by their very nature preventable. In fact, the best estimates now suggest that almost one in five deaths in England is considered preventable.

After years of improvements that curbed the overall impact of preventable disease, progress has started to reverse: disability-adjusted life years (DALYs) statistics reveal that following a consistent decline in overall loss of years to disability or ill health due to a preventable risk factor (from 16,200 to 10,400 million per 100,000 people between 1990 and 2012), we are now beginning to see a slow rise in loss of years and premature deaths (with a reported 10,600 years lost to disability in 2017 per 100,000; IHME 2019).

**FIGURE 1.1: PROGRESS ON PREVENTING ILL HEALTH STOPPED IN 2012**

DALYs in England per 100,000 people, all risk factors



Source: IHME (2019)

Finally, it is worth recognising that, as IPPR has shown previously (Hochlaf et al 2019), compared to other OECD countries, the UK is underperforming in terms of preventing unnecessary illness and death. After initially climbing the league table in 1990, in 2017 the UK ranked just 17th (out of 35 OECD countries) in terms of DALYs with an associated environmental, behavioural or metabolic risk, and 20th in terms of deaths attributable to the same factors.

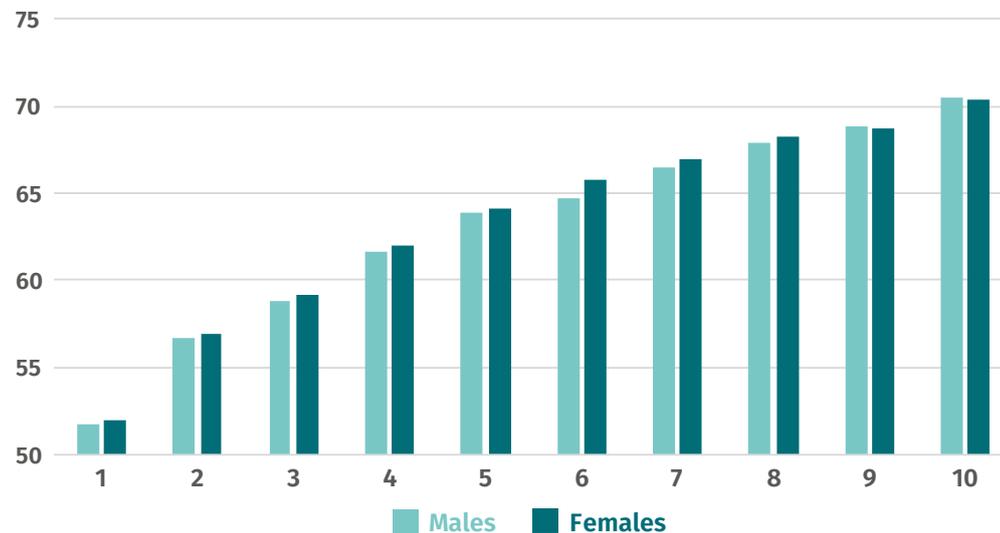
### THE VALUE OF BETTER PREVENTION

As the government’s recent Green Paper, *Advancing our Health: Prevention in the 2020s*, argued, prevention is better than cure. IPPR’s work shows that there are four primary reasons why this is the case:

- People value health. Good health, a state of complete emotional and physical wellbeing, is of intrinsic value to individuals. This is because, as Amartya Sen has long argued, it is a core ‘capability’ required for human flourishing (Sen 1999). Only people benefiting from health can fully participate in society.
- Health creates wealth. A healthy population supports stronger economic performance by improving workforce participation, productivity and educational attainment (Marshall et al 2018).
- Prevention makes our NHS more sustainable. The NHS is struggling to cope with the pressures associated with growing demand (Licchetta and Stelmach 2016). Effective prevention can help reduce pressures by keeping people healthier for longer.
- Health is a prerequisite of social justice. Failing to prevent poor health does not impact society equally. The burden consistently falls heaviest on poorer communities who are more likely to live in poor health and die young.

**FIGURE 1.2: GAPS IN LIFE EXPECTANCY ARE LARGER IN DEPRIVED COMMUNITIES**

Healthy life expectancy across the income range, 2018



Source: ONS (2019)

## ADDRESSING THE CAUSES OF ILL HEALTH

Any policymaker wishing to act on the case for better prevention will need to grapple with the underlying causes of ill health. The evidence is clear that a range of factors impact on our ability to prevent ill health, including the services we receive, the conditions we live in and the genes we inherit from our parents (DHSC 2019).

In addition, lifestyle choices are important: indeed, evidence suggests that four main unhealthy behaviours – smoking, excessive alcohol consumption, poor diet and low levels of physical activity – often 'co-occur' and contribute to the preventable disease burden (Buck and Frosini 2012). Likewise, choices about the services and treatments we use are also vital.

## THE SOCIAL DETERMINANTS OF HEALTH

Health inequalities are entrenched by adverse social and economic conditions. There is well-documented evidence on the “causal pathways from social factors to health outcomes”. Disadvantages suffered in early life have been “repeatedly associated with vulnerability to a range” of diseases. Social stressors have physiological consequences which worsen the health outcomes of individuals from such backgrounds (Braveman and Gottlieb 2014). Social challenges aggravate physical and mental wellbeing through the pressures and stress that such conditions place on individuals.

Poor social conditions are also associated with worse health behaviours. Greater stress and fewer resources to invest in health are associated with a greater propensity to indulge in unhealthy behaviours such as smoking, heavy drinking and overeating. The adversities of a life spent in poverty or on the breadline induces such behaviours as a “coping” mechanism as individuals look to self-medicate (Pampel et al 2010). Harmful behaviours have a cyclical impact, making it more likely for those from disadvantaged backgrounds to develop an illness or disease, which may compound their financial position and trap individuals in persistent poverty.

The role of social determinants in influencing health outcomes requires a broader strategy to address health inequalities. Investing in material resources for disadvantaged communities, improving housing stock, promoting better employment practices and forging social connections can play a crucial role in alleviating the burden of disease across society (Bibby and Lovell 2018). Tackling health inequalities requires going to the roots of poor health which increase the risk of disease, primarily through encouraging harmful behaviours.

## BEHAVIOUR CHANGE

This has led policymakers to focus on how to encourage behaviour change among people in the UK in order to deliver better health. There are a range of levers available to policymakers looking to do this (see figure 1.3). Policymakers have historically leaned disproportionately on levers that ‘blame and punish’ the individual for ‘bad decisions’ (such as regressive taxes and bans), rather than those that ‘empathise and assist’ the public to make better decisions (Hochlaf et al 2019).

**FIGURE 1.3: POLICYMAKERS HAVE A NUMBER OF LEVERS AVAILABLE TO THEM IN THE FIGHT AGAINST PREVENTABLE DISEASE**

Six policy levers to drive behaviour change



Source: Hochlaf et al (2019)

We have called for a paradigm shift in prevention policy to rebalance the use of these levers to drive better health. Health education (meaning initiatives to equip people with the knowledge, skills and motivation required to make better health decisions) should sit right at the heart of this shift (Nutbeam 2000), alongside a focus on support services in the NHS (and across government) and empowerment initiatives, to help drive better decisions and therefore better health outcomes.

## METHODOLOGY

This report is a summary of our research, which includes:

- an extensive literature review focusing on publications covering health education, empowerment, misinformation and the role of technology
- a round-table event with senior stakeholders representing a range of institutions including Public Health England
- polling conducted by Savanta ComRes covering 2,008 British adults aged 18 plus.

## 2. HEALTH EDUCATION IN THE INFORMATION AGE

### WHAT IS HEALTH EDUCATION?

Health education is a concept which has consistently evolved. Although education has long been an essential component of action to promote health and prevent disease (Nutbeam 2000), it has changed markedly in terms of scope and ambition. Below we explore some of the concepts that have emerged in recent decades:

- **Health education.** In its simplest form, ‘health education’ refers to any activity that seeks to inform the individual on the nature and causes of poor health, with the aim of helping people make better sense of their actions and behaviours (Whitehead 2004). However, the simplicity of this approach has been critiqued for ignoring the complex social and environmental causes of poor health and harmful behaviours. Historically, health education programmes have benefitted the most educated and economically advantaged groups because strategies ignored the social context of behavioural decisions (Nutbeam 2000).

With the consensus that education needs to go beyond information-sharing, additional ideas have been developed:

- **Health literacy.** The inadequacies of a simple approach to health education led to a renewed focus on people’s ability to understand and engage with information about their health. The concept of ‘health literacy’ was developed, incorporating all of the required competencies of people to meet the complex demands of health in modern society (Sørensen et al 2012). The key features of this approach – including information appraisal, understanding the social determinants of health and collective action – have been shown to potentially support improved health outcomes (Chinn 2011).
- **Health promotion.** Like health literacy, ‘health promotion’ has broader ambitions to empower people. Health promotion is defined as a process of enabling people to exert control over the determinants of health to achieve healthier lives. The evaluation of success has been disputed, with some arguing that no single methodology is right for all programmes (Nutbeam 1998). Nevertheless, the concept of health promotion has long been integrated into the strategies and direction of the World Health Organization (WHO) as a means of enabling people to increase control over, and to improve, their health (WHO 1986).

While knowledge and skills are crucial, there remains a question of whether this is enough to push people into making serious lifestyle changes. To this end, there is one more concept relevant to our understanding of what health education is for:

- **Patient activation.** This concept has some overlaps with the idea of health literacy, but it focuses not just on the ability of people to understand health information but their willingness and confidence to act on that information. It also recognises the role of empowerment: of giving people the tools to communicate what they need and want in terms of their health rather than the more paternalistic concept of ‘promotion’. Patient activation has been found to be the best predictor of healthy behaviour over a wider range of outcomes (Hibbard and Gilbert 2014).

Health education should be recognised as central to the process required to achieve patient activation. Information is necessary so people are at least aware of how they can maintain good health and understand the consequences of their personal actions. However, the basics can only be seen as a starting point. Education must go further to help people adapt to their environment and ultimately ensure they are confident enough to make healthier decisions. This will not take place in a vacuum and additional initiatives to promote better health will still be required, but education can and should play a pivotal role on the road to patient activation.

## HOW DO PEOPLE RECEIVE HEALTH EDUCATION?

The ways in which people educate themselves about their health is changing. Traditionally physicians were regarded as the main purveyors and integrators of health information, due to their expert knowledge. However, patients spend relatively little time with NHS practitioners nowadays. Instead they often look to experts within their community and, increasingly, the mass media for relevant health information (Cotten and Gupta 2004).

But, in recent times, these sources have been eclipsed as the main source of health knowledge by the internet. The web has revolutionised how we access and communicate information. The impact on health-seeking behaviours has been profound. Previous estimates have suggested that 75 per cent of the UK population uses the web to seek health information, while 50 per cent uses the internet to self-diagnose (Nuffield Trust 2016).

To better understand the state of health knowledge in England today and to analyse the relationship between individuals and technology as a means of acquiring health information, we have commissioned bespoke polling<sup>3</sup> that gives us a clear understanding of where there is room for improvement, while confirming a number of trends:

- Our polling confirms that the internet is currently the first resource people turn to when looking to understand their health. Approaching half of British adults (48 per cent) say the internet is one of the sources via which they have learned the most about health conditions or treatments (for example, symptoms, medical diagnosis, possible treatments). This made it as important as the NHS as a source of information (also 48 per cent). Meanwhile, the internet is one of the main sources of information on healthy behaviours (such as the need for diet and exercise, and the harmful effects of smoking or excessive alcohol consumption) (36 per cent) followed by the media (25 per cent) and the NHS (22 per cent).
- People use the internet for a wide variety of health-related issues. Three in five (61 per cent) British adults say they have used the internet for checking symptoms/self-diagnosis when accessing information and advice about health. Approaching half (45 per cent) say they have done this to understand treatment options, while three in 10 (31 per cent) say they have used the internet to improve their lifestyle choices. British adults are less likely to say they have used the internet to connect with people for health support or advice (nine per cent) or with health services or experts (eight per cent).
- While the polling shows the internet is widely used for health information, it also demonstrates that it is not widely trusted. Three-quarters (75 per cent) of British adults rank the NHS (GP, nurses and so on) as the source of information or advice about health they trust the most, with 86 per cent ranking it among their top three most trusted sources. This compares to just five per cent of

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<sup>3</sup> Poll conducted by Savanta ComRes; 2,008 British adults online between 22 and 24 November 2019 were interviewed. Data were weighted to be representative of all UK adults aged 18 or over. Savanta ComRes is a member of the British Polling Council and abides by its rules.

people ranking the internet as their most trusted source and approaching two in five (38 per cent) putting it in their top three most trusted sources. When using the internet, three-quarters (76 per cent) of those who have used the internet to access information and advice about health rank the NHS website as the source they think is the most trustworthy.

- In contrast, social media is considered to be one of the least trusted sources for health information. Almost two in five (37 per cent) of those who have used the internet to access information and advice about health ranked social media as their 7th out of 7 trusted sources, suggesting a high degree of scepticism towards the information disseminated on such platforms. Tabloid media outlet websites were also viewed unfavourably as trustworthy sources of information, with just 5 per cent including them among their three most trusted sources. This suggests that the majority of people may be happy to use the internet but are willing to question the information they receive online.
- Polling also suggests that the NHS website is by far the most utilised resource, with people avoiding 'less trusted' resources. Four in five (81 per cent) British adults who have used the internet to access information and advice about health say they have used the NHS website. After the NHS website, the most selected online source for accessing information and advice is health charity websites (28 per cent). British adults are less likely to say they have used social media (15 per cent), chat rooms or forums such as Mumsnet or Reddit (14 per cent), businesses or private company websites (11 per cent), or media websites (11 per cent for broadsheets and 3 per cent for tabloids).
- A separate poll conducted after the outbreak of Covid-19 has shown that more traditional outlets of information still have the trust of the British public. Around two in five (42 per cent) British adults ranked the Downing Street 5pm press conference as their most trusted source of information regarding Covid-19, substantially higher than the next most trusted source, with 24 per cent of British adults saying that broadcast media on the television and radio were their most trusted source. In contrast, there seems to be less trust in online outlets. Only five per cent of people said that their most trusted source of sharing accurate Covid-19 information were social media platforms, while four per cent said online media outlets such as BuzzFeed and MailOnline were their most trusted source. In addition, 18 per cent of people ranked social media and online media platforms in their top three (out of six) most trusted sources. In contrast, 78 per cent and 56 per cent ranked broadcast media respectively in their top three trusted. While the information age presents new opportunities to help spread information, it is clear that modern, online platforms have yet to build the trust that more traditional outlets and sources command.

## HEALTH EDUCATION IN AN INFORMATION AGE

There have been significant benefits associated with the rise of the internet – and wider technology – in health and care. Technology has helped to provide people with more ability and more confidence to seek health information. The internet acts as a 'communication process', which has helped change the relationship between patients and healthcare providers (McCray 2005). Notably, it can help shift health education from a paternalistic relationship between doctor and patient, putting more control into the hands of the individual (Beacom and Newman 2010), allowing patients to communicate more powerfully what they want from their care.

Technology has also helped create a world of data that can be used to inform individuals and their healthcare providers. New analytical tools used to predict risk based on historical information are already widely used and can help identify groups for targeted interventions. Making use of devices such as smartphones and wearables also has great potential through collecting real-time data (Bardsley et

al 2019), which can create a feedback loop between the patient, professionals and providers on an ongoing basis.

Social media has created new avenues through which health information can be disseminated. Patients can access and share information from across the globe. This has created new opportunities for healthcare professionals to use such “channels” to identify compelling messages and topics of interest. Social media has also given rise to the “influencer”, individuals who are seen as credible representatives of specific industries and who have built a large online following. Such individuals have the potential to “encourage a thoughtful dialogue on public health topics” thanks to their wide-reaching audience and authenticity (Heldman 2013). The role of individuals, communities and organisations to positively share information and influence public opinion on health matters has never been greater.

Unfortunately, not everyone has been able to enjoy the benefits of technological advances, as highlighted by three core issues.

### **1. Inequitable access to information**

Not all groups are able to access information equally. Evidence has shown that social status and education level can affect whether people will seek out health information, as well as which sources they will use and their interpretation of them (Nielsen-Bohlman et al 2004). Those with lower levels of educational attainment have significantly lower odds of going online to engage with health professionals or track their health information (Kontos et al 2014). Likewise, other reviews have found that those who could most benefit from the application of technology to provide health information are least likely to make use of it, with older people living alone or in rural areas associated with lower internet usage for health purposes (Reiners et al 2019).

### **2. A lack of trust in information**

Many find it difficult to navigate the vast amount of information available online. People are frequently and repeatedly exposed to quick, often contradictory, bits of information from the government, health services, businesses and charities (Nielsen-Bohlman et al 2004). A wide body of literature has found that lower health literacy, as measured by proxies such as general educational attainment, is negatively related to the ability to evaluate and trust online health information (Diviani et al 2015), leaving certain groups prone to digesting disinformation (inaccurate information on the internet).

While clinicians are widely trusted, there is a sense of dependency which makes utilising online resources more difficult for patients. Evidence has found that many patients who are discharged from hospitals “receive insufficient information about their illness and self-care” which can lead to deteriorating conditions, while other studies have revealed a “lack of effective” family education in health care centres, despite many people being reliant on their family networks to provide remedies and advice for common ailments (Farahani et al 2013). Given that lack of trust has posed a problem for the dissemination of health information, the few sources who are trusted should take advantage of opportunities to help enhance patient and community understanding of health-related issues.

The growth of social media has facilitated a greater number of peer-to-peer groups, which allow people with specific health conditions or interests to find people with similar experiences to exchange thoughts and advice. Peer-to-peer platforms have been found to have numerous benefits, including encouraging patient engagement and providing social support networks that help empower individuals to make better health decisions. However, the peer-to-peer model also poses certain risks. Conflicting information can confuse patients and potentially

leads to a “deterioration of trust” in medical professionals who may prescribe different advice or prescriptions (Peterson et al 2019). Again, building trust requires taking advantage of the many existing groups which help to disseminate health information, but more must be done to ensure there is collaboration across these different platforms to realise their benefits and mitigate any potential risks.

There are also opportunities for trust to be exploited in the age of social media. Some studies have found “influencers” to target their audience carefully to promote a “relationship of dependency” between themselves and their followers, which can be used irresponsibly to promote unhealthy behaviours (Pilgrim and Bohnet-Joschko 2019). Other influencers have been found to receive payment in order to promote products which offer “false hopes” to people seeking health-related information (Raafat 2018). Nevertheless, if constructive partnerships can be built between influencers and public health organisations, there is scope for ensuring that these individuals can play a greater role in promoting health education (Heldman et al 2013). Understanding the dynamic of influencers in the health sector on the wider population requires more study, but while there is a clear case for partnering and supporting reliable influencers, there is concern that some in this group may be a source of health misinformation.

### THE STATE OF PUBLIC EDUCATION ON HEALTH

While information technology has provided the public with more opportunities to learn more about health and related issues, there remain concerning gaps which may benefit from educational interventions.

Obesity is associated with many diseases and chronic conditions. As obesity rates rise, especially among children, there is concern for the future public health burden this will likely trigger. Yet, the polling indicates that there are gaps in public knowledge regarding the potential threats linked to obesity. Our polling showed that less than half (47 per cent) of British adults polled associate obesity with cancer, despite the fact that obesity is ‘the second biggest preventable cause of cancer’ in the country (Brown et al 2018). While a majority of British adults do associate obesity with diabetes (85 per cent), cardiovascular disease (74 per cent) and strokes (60 per cent), there is still a substantial group that does not recognise the link between obesity and these health risks. This has serious implications for the success of previous initiatives in improving public understanding of the threat posed by obesity.

Another concern for public health bodies has been the rise of the anti-vaccination movement. It has long been known that ‘websites opposing vaccination are prevalent on the internet’, making false claims that can impact vaccination decisions (Kata 2012). To gauge public sentiment on vaccine safety, respondents were asked their opinion on whether or not vaccines caused autism<sup>4</sup>. While the majority (62 per cent) disagreed with the statement that vaccinations cause autism, a significant proportion (32 per cent) said they did not know and one in 20 (six per cent) even agreed with the statement. The controversial research claiming a link between autism and the MMR<sup>5</sup> vaccine published in 1998 has been repeatedly discredited, with no further studies finding such a link (NHS 2019b). Nevertheless, doubts over the safety of vaccinations could compromise uptake rates; crucial since vaccinations play a critical role in preventing the spread of infectious disease. It is essential that people are educated on the safety

4 Autism is not an illness or disease. The National Autistic Society defines autism as a ‘lifelong developmental disability that affects how people perceive the world and interact with others’.

5 Measles, mumps and rubella.

and consequences of common medical procedures that play a key role in reducing the prevalence of poor health.

A final area explored by our polling was the use of antibiotics. Antibiotics are used to treat a number of potentially fatal bacterial infections including pneumonia and tuberculosis. However, fears have been raised over antibiotic resistance due to their over-consumption. Antimicrobial resistance is now a serious threat to global health and increases the risk of mortality from previously treatable conditions (WHO 2018). Recent awareness campaigns on antimicrobial resistance seem to have had some impact with the public, as four in five British adults polled (78 per cent) agreed that antibiotics are overused in the UK. However, adults over 55 were more likely (87 per cent) to agree than those aged 18 to 34 (70 per cent). While the public seems to be broadly receiving the message of concern over antibiotic consumption, there is still some way to go.

An even more sinister threat is that of intentional misinformation or disinformation which can play on personal fears or an individual's belief system through confirmation bias (Del Vicario et al 2015). This has been denounced as a threat to society by the World Economic Forum (WEF). Evidence has suggested that individuals are relying more and more upon social media platforms for news, which may expose people to 'fake news' on major health threats such as antimicrobial resistance (Groshek et al 2018). The concern of disinformation has also been closely linked to the increase in online misinformation and a fall in vaccination levels, although at present this has been deemed 'correlational rather than causal' (Goodman 2019).

Health misinformation can be uploaded instantaneously, making it extremely difficult to counter. A key challenge for the medical profession is "determining the threshold at which an intervention is needed" to combat the pernicious impact of online misinformation (Chou et al 2018). The rapid pace at which social media trends can escalate and the extent to which they persist or have influence makes it difficult to provide an accurate estimation of the scale of the problem. Previous studies have shown how misinformation typically generates around specific health threats, from re-enforcing positive messages regarding anorexia and eating disorders to scaremongering over the spread of infectious diseases during times of heightened concerns, such as the recent Ebola crisis (Fernandez-Luque and Bau 2015). Developing new methods to monitor and track the spread of health misinformation may play an important role in mitigating its effects.

The Covid-19 crisis has given us an insight into how rapidly disinformation spreads. Our Covid-19 poll revealed that nearly half (48 per cent) of all British people had either seen or been sent "fake news" about Covid-19, online since the outbreak began. In addition, almost two in five (17 per cent) people said they did not know whether they had come across 'fake news' suggesting that the ability to identify and report the spread of misinformation is less than perfect. Younger people were more likely to report that they had seen misinformation online with 60 per cent of 18 to 24 year olds and 58 per cent of 24 to 34 year olds claiming to have come across "fake news" on the internet. In contrast, among those aged over 65, only 36 per cent said they had seen fake information, although this may reflect the reduced time spent online by older adults. The consequences of spreading health misinformation are always serious, but Covid-19 has demonstrated just how quickly falsified stories can spread and the need for firm action.

### **3. An inability to act on information**

Furthermore, there is growing evidence that even if people are accessing more information, they vary significantly in their ability to act on this information. Knowing what is best for your health is different to having the agency, motivation and social conditions necessary to follow through on that knowledge. While this is the case across the income distribution and at all levels of educational attainment, this is a particular challenge among those facing social disadvantage – partly due to their increased likelihood to suffer from limited health literacy (Ellermann 2017).

Furthermore, social disadvantage itself plays a role in denying socially vulnerable groups from making positive changes: inadequate housing, occupational stress, a lack of supportive interpersonal relationships (Israel et al 1994); all are mechanisms that diminish people's ability to take control over their own health. The result is that the wealthiest are consistently more able to take full advantage of public education efforts (Quine et al 2004).

If failure to act on genuine information is one side of the challenge, the other is the tendency for people to use misinformation to act in harmful ways. Health information use can be “very personal” and many people may “unconsciously select” information that confirms their existing opinions (Wang 2018). Personal biases may compromise the ability of individuals to research effectively and follow through with positive health behaviour changes.

### **FROM INFORMATION TO EMPOWERMENT AND ACTIVATION**

Technology and the internet have been transformative in terms of how people manage their health. However, this transformation has not been universally positive: It has been asserted that technology has had a likely role in exacerbating health inequalities (Weiss et al 2018) and created the possibility of disinformation and misinformation. Efforts to use information and education to manage these challenges have not been as successful as we would like.

However, a successful strategy must develop a comprehensive approach to health education. Providing information is no guarantee that people will use it in a constructive way or be able to navigate the abundance of information readily available online, which may even potentially be inaccurate. Empowerment can only be achieved when individuals can confidently assess the validity and accuracy of what they find online and are capable of researching areas of interest, either independently or under the guidance of health professionals.

Empowerment via education is key to patient activation. Once individuals are able to acquire relevant and accurate health information, they are better placed to make the decisions that will influence their health and wellbeing. This means ensuring that every patient diagnosed with a condition understands what they are dealing with and how to manage it. It means that individuals, even when facing social pressures, can maintain a resilient commitment to healthy behaviour. It also means that individuals can confidently assess and check the information they receive online without being swayed by inaccurate or misleading claims.

The evidence is increasingly clear that we need to go further. We need a new approach that puts empowerment and activation at the heart of health education efforts, so people have the knowledge and skills to determine which information to act on and the confidence to do so. Technology can be a driver of better health – it can enable people to take real control of their lives and shape their own care – but we need to reform policy to enable this to happen.

### 3.

## POLICY RECOMMENDATIONS: REGULATE OR EDUCATE?

### TWO APPROACHES TO BETTER HEALTH

In looking forward at how to drive better health in the information age, two approaches have been identified.

1. **Regulation** – policies which aim to restrict the availability of information online and combat the rise of false information, while simultaneously helping individuals find accurate sources approved by credible institutions.
2. **Education** – policies focused on enhancing the ability of individuals to access, understand, critically evaluate and act on information (including communicating their needs and choices) in a way which improves their personal behaviour.

### REGULATING ONLINE INFORMATION

Commentators, the public and politicians are increasingly interested in regulation, with calls for government to regulate content on the internet more closely. Proposals focus on removing inaccurate information, improving the availability of correct information and giving the public assurances that the information they receive is reliable and accurate. For example, some have called for tech firms to have greater legal obligations to remove inaccurate information while others have called for a government kitemark to certify websites that are deemed reliable and safe.

There is an appetite for technology firms and social media platforms to take more responsibility for the spread of harmful information. In the poll we conducted, 85 per cent of respondents agreed that platforms such as Twitter and Facebook should be taking more responsibility for regulating misinformation and disinformation on their sites. While a significant majority at 67 per cent believe the government should be doing more to regulate the internet in order to reduce misinformation and disinformation, it should be noted that almost a quarter (24 per cent) of adults disagreed.

In the wake of Covid-19, there is also a strong support for the National Health Service to work more closely with large tech firms to share health information to support public health campaigns. Our separate Covid-19 poll showed that two in three (67 per cent) British adults agreed that the partnerships initiated during the crisis between the NHS and large tech groups, should continue post-Covid-19.

While in an ideal world we would simply ban the spread of harmful information, we must recognise that there are severe limitations to this approach. Notably, who determines what information should be available: there are grave risks associated with making governments the arbiter of truth. Furthermore, the vastness of the internet makes it virtually impossible to regulate and control what can be accessed at any given time. Finally, the ability to regulate the internet at a domestic level is limited: to do so would require an international consensus which may be desirable but does not appear forthcoming.

Instead, the government would be better advised to invest in harnessing the internet and new technologies for good. We recommend the following.

- The government has recently established a specialist unit to combat the spread of disinformation surrounding the Covid-19 (Coronavirus) emergency. We recommend that this unit should be made an independent and permanent fixture of the Department of Culture, Media and Sport (DCMS). This unit should be tasked with identifying areas where health disinformation is particularly prevalent and should work with other government departments, tech firms and partners across civil society in order to curb its reach. During emergencies, such as the spread of Coronavirus, this will allow for a rapid response to disseminate relevant information and appropriate medical advice. However, during other periods, the unit will be responsible for tackling disinformation related to wider health issues, lead media campaigns to promote better health behaviours and help identify the various ways in which disinformation campaigns appeal to the public in order to craft more effective responses in the future. We recommend that this unit should operate independently within the DCMS, but regularly liaise with other departments, such as DHSC to help identify any emerging threats and notable public health issues.

- The government should put more investment into public education campaigns including into the issue of misinformation and disinformation. From our bespoke poll we find that there remains a substantial proportion of adults who are unaware of how certain behaviours are associated with preventable diseases. Public health campaigns can be a positive way to help increase awareness among the general population. Social media offers a new opportunity to overhaul traditional mass media campaigns and allow for targeted interventions based on the characteristics of the individual's own digital profile.

Evidence has found that social media has several distinct benefits, including the encouragement of engagement between the public and health professionals, tailored information-sharing and helping to stimulate the provision of social support among peers. However, there remain concerns regarding the 'lack of reliability, confidentiality and privacy' that is associated with such platforms (Moorhead et al 2013). **We recommend that the NHS and government partner with social media sites to create a stream of tailored and relevant public health messages that help tackle gaps in the public's knowledge and promote awareness of emerging public health concerns, while providing opportunities for the public to learn more about issues from accurate sources.**

- **The government should look to enhance the NHS app with new features designed to encourage behaviour change.** The current NHS app went live on 1 January 2019 and was downloaded over 200,000 times in the first half of the year. The app is designed to help people access NHS services, book appointments and check symptoms. In addition, the NHS Apps Library has over "70 approved apps" across a variety of health areas and the NHS continues to work with the public and partners to increase the number of trusted apps available (NHS Digital 2019).

However, the NHS app itself should play a greater role in supporting better health outcomes. The NHS is one of the most trusted sources of health information and its app has already attracted a significant amount of public attention. There is growing evidence that app-based interventions which 'improve diet, physical activity and sedentary behaviour' can potentially be effective (Schoeppe et al 2016). The NHS should look to advance its own app in order to support behaviour change and reduce the prevalence of preventable conditions within society.

NHS Digital already has an assessment criteria in place to evaluate health apps and can make use of its extensive partnerships in order to continue to research the features of effective apps. The popularity and trust placed in the NHS, as well as its prominent role in the UK health sector, gives it an ideal platform to lead innovation into new technology, as well as continuing to encourage and support an environment where those outside the sector can continue to innovate and develop new apps.

With the recently launched NHSX unit dedicated to bringing the NHS and government teams together to lead digital transformation in the health service, the government should look to support them in further developing NHS branded apps geared towards shifting behaviours and tackling preventable disease. We recommend that either the NHS should take a leading role in supporting the development of such an app, either internally or through working with external innovators, to ensure that a range of highly-trusted and popular NHS apps are available to clinical staff and the general public.

## **EDUCATION FOR BETTER HEALTH**

If we cannot fully regulate the information that people are able to access on the internet, we must ensure that they have the knowledge, skills and motivation to access the right information, understand it and utilise it as a source of empowerment; to voice their needs and preferences about their health and to change their health behaviours. This requires wider educational interventions, to help fully realise the potential of new technology in disseminating health information.

Fortunately, the public education system offers a perfect opportunity to enhance the offer of health education in schools and colleges and provide people from an early age with the skills necessary to navigate online health information. This includes how to identify accurate information and how to harness this for the benefit of their personal health. With childhood health issues, such as obesity, a key concern across the health sector, emphasis on the role of schools has increased. Through formal health education implemented within the curriculum, developing an ethos within the school environment or engaging with the local community, schools can provide broad and targeted interventions to improve student awareness of health issues and encourage healthy lifestyles at an age where the positive effects can persist into adulthood.

However, it is not just when children reach school age that public interventions can generate benefits. Health visitors charged with reaching out to new parents and inspecting newborn children can provide an important service in offering advice and guidance on how to create a healthy environment at a young age when development is crucial. Further, qualified health visitors can identify any areas where more information could be beneficial, again offering targeted support where appropriate.

This requires significant additional investment in health education, promotion and activation. Previous policy initiatives in this space have focused on the first step set out above (ensuring people have access to information), which, while a prerequisite for behaviour change, is not enough on its own. Going forward, policy must also focus on the second two steps: helping people to understand and act on the information available to them.

The public appetite for a more proactive approach to spreading health information by government is also very strong following the outbreak of Covid-19. Our Covid-19 poll shows that at least two in three British adults would support current measures being used to spread information about Covid-19, including television adverts (78 per cent) and text messages (64 per cent), to be used to address other public health concerns when the crisis is over.

This means asking our public education and health services to take on a bigger role in health education. This approach receives significant public support in the research we have conducted – 85 per cent of people want to see schools take a more active approach in educating students about healthy lifestyles and 82 per cent believe the NHS should be providing more support and guidance on where to access health information.

We therefore recommend that government do the following.

- Ensure that lessons to teach children about health and care are incorporated into the core curriculum. Schools are on the front line, and delivering education and improving health behaviours in childhood can reduce the risk of adverse health outcomes and negative health behaviours later in life. It has been found that a 'whole school approach to health and wellbeing' improves readiness to learn and personal, social, health and economic education (PSHE) is effective in equipping young people with 'self-confidence and enhanced decision-making skills', which are essential from a public health perspective (DfE 2015). As it stands, relationships, sex and health education (RSHE) is part of the national curriculum but health is not compulsory in all schools. We welcome the government's commitment to change this in state schools from 2020 onwards. But it is crucial that the content is right (including elements on where to access health information and how to identify misinformation) and that the quality of teaching is high. As it stands, up to 40 per cent of schools are rated 'not good enough' on their PSHE offer and 6 per cent of schools do not offer it at all (PSHE Association 2018). This is simply not good enough: promoting health awareness to children is not an add-on to maths and English; it should be part of the core business of schools in this country and a portion of the promised £7.1 billion into schools by 2022/23 should be reserved for promoting health education.
- The provision of one nurse (or other trained clinical staff member) per 600 school students to promote better health should be mandatory across schools in England. There has been "a significant decline in school nurses" in recent years, despite their vital role as a source of trusted health information among children. They are also seen as professionals who can help identify specific health challenges within schools and "improve the overall wellbeing of those living with long-term conditions" as well as academic performance (Fagan et al 2017). In Finland, a ratio of 1:600 between nurses and school students exists and we believe we should legislate to match this. At present, we estimate that the ratio is 1:3,900 in England, far below other European countries. To remedy the gap, we would need an additional 11,500 nurses. We estimate the potential wage bills would be £445 million each year to adequately fund student nursing, plus an increase in training places would need to be made available.

Such an ambitious target would mean incorporating school nursing more prominently into the NHS workforce strategy and the Health Education England (HEE) People Plan. This will require closer collaboration between the health and education sector. The cost estimated to train a nurse from scratch is £70,000 (Lee 2015). This would suggest the total cost of training an adequate number of school nursing staff would be £805 million. In order to ensure this target is realistic, we recommend that this should be a decade long target at a cost of just over £80 million a year, which should be invested into a larger funding settlement for HEE to help train school and community-based nurses.

The potential impact that a robust school nurse system would have in identifying at-risk students – helping to provide them with valuable health information and support to make lasting change – would have benefits for their health and academic outcomes throughout childhood. In Finland, evidence suggests that the greater presence of public health nurses across

society, including schools, has been beneficial for health and "a large decrease has been seen in adolescent risk behaviours" (Grym and Borgermans 2018). Not only would this help reduce the burden of demand on other NHS services and its workforce in the future, it would mean the creation of several thousand skilled jobs.

- Invest in the NHS to ensure anyone exhibiting risky behaviour (such as those who smoke or are clinically obese) or with a newly diagnosed condition has access to a personal care plan, social prescribing and peer support networks. The NHS Long Term Plan has promised to roll out "universal personalised care", a robust package of interventions aimed at providing people with support networks and care plans so that they can adopt healthier lifestyles to prevent the development of health problems or the deterioration of existing conditions. The ambition is to reach 2.5 million people by 2023/24 and 5 million by 2028/29. While we support this aspiration, we reiterate our call (Hochlaf et al 2019) for the entitlement to these interventions to be put into the NHS Constitution to ensure access. The government will need to work with civil society organisations to achieve these aims and we recommend that a funding mechanism – such as a social prescribing tariff – is put in place. This would allow for adequate resources to be used to support NHS staff and civil society organisations in providing patients with the support they need to understand the risks they face, and, more importantly, to understand how they can take proactive steps to use this information to enable behaviour change.

## CONCLUSION

In conclusion, we must draw on both regulation and education to ensure that people are better informed about health and the role of personal behaviour. New technologies have created opportunities to reach wider audiences, but there is still a long way to go to ensure that every member of society has access. Technology also poses a challenge in the form of the spread of harmful health misinformation. It is clear that this necessitates a more robust strategy from both government and industry to combat disinformation and ensure that reliable sources are easy to identify.

It is also clear that the NHS and health sector more broadly need to take a more proactive approach to engage with new technologies. As an extremely trusted source of health information, it is imperative the NHS stays ahead of the curve and takes advantage of new methods of communication, such as mobile apps, to help provide individuals with better support to manage their health and promote better outcomes. Influential figures within the health sector can also play a greater role in the dissemination of health information, reaching a wider, more diverse audience thanks to social media and other online platforms.

Yet, even with the correct information, individuals cannot necessarily utilise it to significantly improve their behaviours if they are living in arduous circumstances. A combination of policies that equip people with care, support and resilience to use their knowledge to improve their lifestyles is fundamental for the potential of education to be unleashed.

# REFERENCES

- Bardsley M, Steventon A and Fothergill G (2019) *Untapped Potential: Investing in health and care data analytics*, The Health Foundation. <https://www.health.org.uk/sites/default/files/upload/publications/2019/Untapped%20potential.pdf>
- Beacom A and Newman S (2010) 'Communicating Health Information to Disadvantaged Populations' in *Family & Community Health*, 33(2), pp152-162
- Brown KF, Rungay H, Dunlop C, Ryan M, Quartly F, Cox A, Deas A, Elliss-Brookes L, Gavin A, Hounsome L and Huws D (2018) 'The Fraction of Cancer Attributable to Modifiable Risk Factors in England, Wales, Scotland, Northern Ireland, and the United Kingdom in 2015', in *British Journal of Cancer*, 118(8), p1130
- Buck D and Frosini F (2012) *Clustering of Unhealthy Behaviours Over Time: Implications for policy and practice*, The King's Fund. [https://www.kingsfund.org.uk/sites/default/files/field/field\\_publication\\_file/clustering-of-unhealthy-behaviours-over-time-aug-2012.pdf](https://www.kingsfund.org.uk/sites/default/files/field/field_publication_file/clustering-of-unhealthy-behaviours-over-time-aug-2012.pdf)
- Chinn D (2011) Critical Health Literacy: A review and critical analysis. *Social Science & Medicine*, 73(1), pp60-67. <https://www.sciencedirect.com/science/article/abs/pii/S0277953611002401>
- Cotten S and Gupta S (2004) Characteristics of Online and Offline Health Information Seekers and Factors that Discriminate Between Them. *Social Science & Medicine*, 59(9), pp1795-1806. <https://www.sciencedirect.com/science/article/abs/pii/S0277953604000796>
- Del Vicario M, Bessi A, Zollo F, Petroni F, Scala A, Caldarelli G, Stanley HE and Quattrociocchi W (2016) The Spreading of Misinformation Online, in *Proceedings of the National Academy of Sciences*, 113(3), pp554-559
- Department for Education [DfE] (2015) *Personal, Social, Health and Economic (PSHE) Education: A review of impact and effective practice*
- Department of Health and Social Care [DHSC] (2018) *Prevention is Better Than Cure: Our vision to help you live well for longer*. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/753688/Prevention\\_is\\_better\\_than\\_cure\\_5-11.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/753688/Prevention_is_better_than_cure_5-11.pdf)
- Department of Health and Social Care [DHSC] (2019) *Advancing our Health: Prevention in the 2020s*, UK Government
- Diviani N, Van den Putte B, Meppelink CS and van Weert JC (2016) 'Exploring the Role of Health Literacy in the Evaluation of Online Health Information: Insights from a mixed-methods study', in *Patient Education and Counseling*, 99(6), pp1017-1025
- Ellermann C (2017) Promoting Health Literacy to Reduce Health Inequalities in Societies, in *European Journal of Public Health*, 27(3).
- Fagan L, Williams S, Fennell E and Russell J (2017) *The Best Start: The future of children's health*, Royal College of Nursing
- Goodman E (2019) 'How Social Media Companies are Tackling Anti-vaccination Misinformation', LSE, blog. <https://blogs.lse.ac.uk/medialse/2019/07/24/how-social-media-companies-are-tackling-anti-vaccination-misinformation/>
- Groshek J, Katz JE, Andersen B, Cutino C and Zhong Q (2018) Media Use and Antimicrobial Resistance Misinformation and Misuse: Survey evidence of information channels and fatalism in augmenting a global health threat, in *Cogent Medicine*, 5(1), p1460898
- Grym K and Borgermans L (2018) *Public Health Nurses in Finland: A life-course approach to the prevention of noncommunicable diseases*, World Health Organization, Regional Office for Europe
- Hibbard J and Gilbert H (2014) *Supporting People to Manage their Health: An introduction to patient activation*, The King's Fund. [https://www.kingsfund.org.uk/sites/default/files/field/field\\_publication\\_file/supporting-people-manage-health-patient-activation-may14.pdf](https://www.kingsfund.org.uk/sites/default/files/field/field_publication_file/supporting-people-manage-health-patient-activation-may14.pdf)

- Hochlaf D, Quilter-Pinner H and Kibasi T (2019) *Ending the Blame Game: The case for a new approach to public health and prevention*, IPPR. <http://www.ippr.org/research/publications/ending-the-blame-game>
- Institute for Health Metrics and Evaluation [IHME] (2019) 'Global Burden of Disease Compare', dataset. <https://vizhub.healthdata.org/gbd-compare/>
- Israel BA, Checkoway B, Schulz A and Zimmerman M (1994) 'Health Education and Community Empowerment: Conceptualizing and measuring perceptions of individual, organizational, and community control', in *Health Education Quarterly*, 21(2), pp149-170
- Kata A (2012) 'Anti-vaccine Activists, Web 2.0, and the Postmodern Paradigm: An overview of tactics and tropes used online by the anti-vaccination movement', in *Vaccine*, 30(25), pp3778-3789
- Kontos E, Blake KD, Chou WYS and Prestin A (2014) 'Predictors of eHealth Usage: Insights on the digital divide from the Health Information National Trends Survey 2012', in *Journal of Medical Internet Research*, 16(7), pe172. <https://www.jmir.org/2014/7/e172/>
- Licchetta M and Stelmach M (2016) *Fiscal Sustainability and Public Spending on Health*, Office for Budget Responsibility. [http://budgetresponsibility.org.uk/docs/dlm\\_uploads/Health-FSAP.pdf](http://budgetresponsibility.org.uk/docs/dlm_uploads/Health-FSAP.pdf)
- Marshall L, Finch D, Cairncross L and Bibby J (2018) *The Nation's Health as an Asset*, The Health Foundation. <https://www.kingsfund.org.uk/publications/what-does-publicthink-about-nhs>
- McCray A (2005) 'Promoting Health Literacy', in *Journal of the American Medical Informatics Association*, 12(2), pp152-163
- McGovern L, Miller G and Hughes-Cromwick P (2014) *Health Policy Brief: The relative contribution of multiple determinants to health outcomes*, Health Affairs
- Moorhead SA, Hazlett DE, Harrison L, Carroll JK, Irwin A and Hoving C (2013) 'A New Dimension of Health Care: Systematic review of the uses, benefits, and limitations of social media for health communication', in *Journal of Medical Internet Research*, 15(4), pe85
- NHS (2019a) *The NHS Long Term Plan*. <https://www.longtermplan.nhs.uk/wp-content/uploads/2019/01/nhs-long-term-plan.pdf>
- NHS (2019b) 'No link between MMR and autism', major study finds., news story. <https://www.nhs.uk/news/medication/no-link-between-mmr-and-autism-major-study-finds/>
- Nielsen-Bohlman L, Panzer AM and Kindig DA (2004) 'The Extent and Associations of Limited Health Literacy', in *Health Literacy: A prescription to end confusion*, National Academies Press
- Nuffield Trust (2016) 'The World of Digital Health in Numbers', infographic. <https://www.nuffieldtrust.org.uk/chart/infographic-the-world-of-digital-health-in-numbers>
- Nutbeam D (1998) 'Health Promotion Glossary', *Health promotion international*, 13(4), pp349-364
- Nutbeam D (2000) 'Health Literacy as a Public Health Goal: A challenge for contemporary health education and communication strategies into the 21st century', in *Health Promotion International*, 15(3), pp259-267. <https://academic.oup.com/heapro/article/15/3/259/551108>
- Office of National Statistics [ONS] (2019) 'Health State Life Expectancies by Index of Multiple Deprivation (IMD): England, all ages', dataset. <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthinequalities/datasets/healthstatelifeexpectanciesbyindexofmultipledeprivationimdenglandallages>
- PSHE Association (2018) 'Statutory PSHE Education: Meaningful change supported by busy teachers & school leaders'. <https://www.pshe-association.org.uk/system/files/PSHE%20workload%20report%20FINAL%20version%204%206%202018.pdf>
- Quine S, Kendig H, Russell C and Touchard D (2004) 'Health Promotion for Socially Disadvantaged Groups: The case of homeless older men in Australia', in *Health Promotion International*, 19(2), pp157-165

- Reiners F, Sturm J, Bouw LJ and Wouters EJ (2019) 'Sociodemographic Factors Influencing the Use of eHealth in People with Chronic Diseases', in *International Journal of Environmental Research and Public Health*, 16(4), p645
- Schoeppe S, Alley S, Van Lippevelde W, Bray NA, Williams SL, Duncan MJ and Vandelanotte C (2016) 'Efficacy of Interventions that Use Apps to Improve Diet, Physical Activity and Sedentary Behaviour: A systematic review', in *International Journal of Behavioral Nutrition and Physical Activity*, 13(1), p127
- Sen A (1999) *Development as Freedom*, Anchor Books
- Sørensen K, Van den Broucke S, Fullam J, Doyle G, Pelikan J, Slonska Z and Brand H (2012) 'Health Literacy and Public Health: A systematic review and integration of definitions and models', in *BMC Public Health*, 12(1), p80. <https://www.healthliteracypromotion.com/upload/sorenson2012-1.pdf>
- UNESCO (2018) *Journalism, 'Fake News' and Disinformation: A handbook for journalism education and training*
- Whitehead D (2004) 'Health Promotion and Health Education: Advancing the concepts', in *Journal of Advanced Nursing*, 47(3), pp311-320. <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1365-2648.2004.03095.x>
- Weiss D, Rydland H, Øversveen E, Jensen M, Solhaug S and Krokstad S (2018) 'Innovative technologies and social inequalities in health: a scoping review of the literature' *PloS One*, 13(4)
- World Health Organization [WHO] (1986) 'The Ottawa Charter for Health Promotion', First International Conference on Health Promotion
- World Health Organization [WHO] (2018) 'Antimicrobial Resistance', webpage. <https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance>

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