

JULY 2024

PROF SIR JOHN BELL  
TAMSIN BERRY  
PROF JOHN DEANFIELD  
INES HASSAN  
ROSHNI JOSHI  
YANNICK SCHINDLER  
PROF ANDREW SCOTT



# Prosperity Through Health: The Macroeconomic Case for Investing in Preventative Health Care in the UK

# Contents

- 3 Executive Summary
- 6 A Growing Health-Wealth Nexus
- 11 The GDP Benefits of Prevention
- 27 Conclusions and Recommendations
- 30 Acknowledgements

Our [Future of Britain](#) initiative sets out a policy agenda for governing in the age of AI. This series focuses on how to deliver radical-yet-practical solutions for this new era of invention and innovation – concrete plans to reimagine the state for the 21st century, with technology as the driving force.

## 01 Executive Summary

People are living longer, which is shifting the disease burden towards age-related conditions. This is leading to increased pressure on health budgets that are already constrained by weak economic growth and an estimated 2.8 million people who are economically inactive due to long-term sickness.

The new government can break this cycle by proactively shifting to preventative-health measures, made possible by advances in screening, digital tools and early interventions and thereby keeping the working-age population healthy for longer and boosting gross domestic product (GDP).

Currently, preventative-health-care programmes struggle for funding because macroeconomic considerations play a limited role in the allocation of health expenditure. To gauge the potential magnitude of a macroeconomic boost from preventative-health measures, we created a model that can jointly analyse health and macroeconomic policy and estimate the effects of improved health on employment, GDP and government spending. By combining data on health interventions, labour-market status and macroeconomic indicators, our model assesses the broader macroeconomic effects of improved health and the ability of such measures to provide the

necessary finances to fund a preventative-health agenda.

We estimate that a 20 per cent reduction in the incidence of six major disease categories that are keeping people out of work – cancer, cardiovascular disease (CVD), chronic respiratory illness, diabetes and mental-health and musculoskeletal disorders – would have significant macroeconomic benefits. This “improved-health scenario” could raise GDP by an estimated 0.74 per cent within five years – an annual boost of £19.8 billion – and by 0.98 per cent within ten years, equating to £26.3 billion annually. Annual fiscal savings from increased tax revenues and reduced benefit payments could amount to £10.2 billion and £13.0 billion by 2030 and 2035, respectively.

We also conducted distinct analysis on CVD to illustrate this approach. We examined proven treatments that effectively lower low-density lipoprotein (LDL) cholesterol, a CVD risk factor, and reduce the likelihood of CVD. By combining clinical evidence with individual-level labour-market data and our macroeconomic model, we estimate that these readily available treatments could increase annual GDP by 0.08 per cent in 2030 (£2.2 billion), 0.11 per cent in 2035 (£3.0 billion) and 0.13 per cent in 2040 (£3.5 billion). These results demonstrate that even targeted interventions can have significant long-term economic benefits.

This is only part of the argument for prevention. Broadly it should aim to keep people healthy for longer by delaying the onset of multiple diseases instead of just a single one. Treatments that can impact multiple conditions unlock even larger improvements in life expectancy, quality of life, employment, GDP and the public finances – benefits that traditional approaches that target late-stage disease have failed to unlock.

There is emerging excitement around glucagon-like peptide-1 receptor agonist (GLP-1 RA) drugs, in part because they may reflect this multiple mechanism. While ongoing clinical trials will reveal more about these drugs and their effectiveness as a general preventative treatment, they point to a future of innovation in preventative therapeutics that offer the prospect of a 21st-century health system for 21st-century longevity.

Inspired by the potential of GLP-1 RAs, we used our model to evaluate the macroeconomic consequences of a potential drug that lowers the risk of cardiovascular events or associated complications and the incidence of musculoskeletal disorders, through reducing the prevalence of obesity. We

estimate that a hypothetical treatment that leads to a joint 20 per cent reduction in the incidence of both diseases leads to a 0.3 per cent improvement in annual GDP (£8.1 billion) within five years. Notably, our analysis demonstrates that the reduction in musculoskeletal disorders accounts for a larger share of this improvement compared to the reduction in CVD.

This report does not advocate for specific preventative-health measures but instead shows that a strong health and macroeconomic case can be made for prevention through upfront investment. In the face of an ageing population, health and macroeconomics become ever more closely intertwined, requiring a shift in how health expenditure is allocated and how fiscal policy is formulated.

The success of this approach depends on the swift and cost-effective implementation of prevention programmes. An accompanying, but distinct, TBI paper, *The Economic Case for Protect Britain, a Preventative Health Care Delivery Programme*, suggests that if the projected gains are achieved, there could be an estimated net fiscal saving of approximately £0.6 billion per year by the end of the next parliamentary term, increasing to £1.2 billion per year by the end of the subsequent term. As our work demonstrates, the government could start with a CVD-focused programme, given the availability of cost-effective interventions. GLP1-RAs for obesity look promising too; however, a clearer understanding of the costs and benefits is needed before they are used as a tool for prevention. Investing in research in other areas like mental health is also important, particularly where available interventions are less effective. Prioritising these actions can yield substantial health and economic benefits.

To break the cycle of declining health, weak economic growth and constrained health budgets, significant change is imperative. The UK government must shift to a virtuous cycle in which health expenditure also prioritises prevention, keeping people healthier and enabling longer working lives.

## 02

## A Growing Health-Wealth Nexus

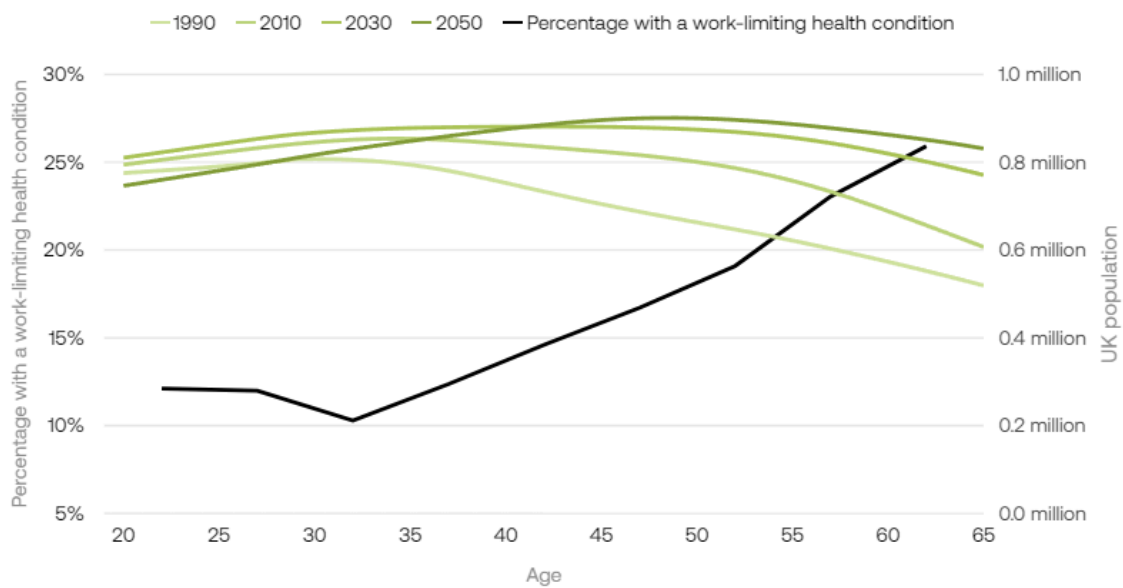
UK health trends are diverging from those of many other countries.<sup>1</sup> Life-expectancy gains are stalling while economic inactivity due to long-term illness is trending upwards. In 2018, the proportion of working-age people in the UK out of employment due to long-term health limitations reached a 30-year low of 4.8 per cent. However, this figure has now risen to 2.8 million, representing a 30-year high of 6.7 per cent. This rising tide of poor health is not only a challenge for individuals but also comes at an increasing financial cost to the country. Lower employment means lower gross domestic product (GDP) and tax revenue, as well as an estimated annual £50 billion spent on sickness benefits for working-age individuals.

This problem will only worsen with an ageing population and the associated increase in chronic diseases such as cardiovascular disease (CVD), dementia and musculoskeletal disorders, among other conditions. As shown in Figure 1, the future growth in the working-age population is increasingly concentrated in the years where illness makes working more difficult. The extraordinary past success of medical treatment has helped prolong life expectancy and resulted in a rising number of older people, but while we now live longer, much less progress has been made in increasing the proportion of life spent in good health. This is leading to increasing health costs and restricting the ability of the rising number of older people to continue in employment. Exacerbating the problem is a growing number of younger people suffering from mental-health conditions. Young people between the ages of 16 and 24 are now more likely than any age group to have a common mental disorder, having previously been the least likely.<sup>2</sup> This has contributed to a doubling of those in this age bracket who are economically inactive due to long-term health problems.

FIGURE 1

# Population age structure and work-limiting illness

Note: Population data have been smoothed to better illustrate demographic trends.



Source: Population data from UN World Population Prospects 2022 dataset, fraction with work-limiting health conditions based on Office for National Statistics Labour Force Survey data (2012 to 2019).

The UK is in danger of slipping into a vicious circle of worsening health that places ever more pressure on health budgets. These in turn cannot be increased due to weak GDP growth, which is reinforced by deteriorating health. There are indications that this vicious circle is making the current health system unsustainable, as shown by the increasing length of waiting lists and declining public satisfaction. Urgent action is required to address these trends. As per Stein’s Law – articulated by economist Herb Stein – “If something cannot go on forever, it will stop.” This underscores the necessity of implementing changes before the system reaches a breaking point.

These developments are as frustrating as they are concerning because so many of these diseases are largely preventable with early and appropriate intervention. The key to breaking out of this vicious circle is, therefore, a shift

towards prevention.

There have of course always been voices advocating a shift to prevention. As far back as at least the 2002 Wanless Review<sup>3</sup> the argument was made that the NHS was on an unsustainable path. The nature of a vicious circle means this argument only gets stronger each year. Fortunately, medical advancements that can offer a way out are also getting stronger.

Due to recent and ongoing innovation, the opportunity for successful prevention using medical treatments both at scale and at a reasonable cost is increasing. Improvements in understanding disease development, genetic testing to refine risk calculation and treatment choices,<sup>4</sup> novel imaging to better identify and characterise disease earlier, blood tests that can predict the risk of future diseases remarkably well before any clinical sign,<sup>5</sup> and the emergence of new therapeutics together raise the tantalising prospect of a 21st-century health system adapted to 21st-century longevity with a focus not on treating disease but on keeping people healthy for longer.

Successful implementation of a prevention strategy will demand not just a shift in how health care is delivered but also in the evaluation of health expenditure. Breaking out of the vicious circle between deteriorating health and weak economic growth requires the development of tools that fully recognise the mutual dependency between health and wealth.

The UK health system, like that of several countries, is based around two key concepts. The first is a focus on disease treatment rather than on health itself. Individuals present themselves to their doctor when they are unwell, and the system responds by trying to identify the disease and respond accordingly. It is this system that is proving unsustainable in response to an ageing population and a shift in the disease burden towards chronic illness. Intervening late in the process of an ageing-related disease is important but it is likely to provide limited health benefits and often long-running costs.

The second key concept underpinning the UK health system is that the focus is on allocating a given budget to achieve a variety of important health-related measures of outcomes, such as Quality Adjusted Life Years (QALY) or hospital waiting-list targets. As a consequence, much of the macroeconomic perspective on health focuses on the size of the health budget rather than how it is allocated in a way that could influence both health and economic outcomes



This dual focus on disease and allocating funds with only health outcomes in mind is a problem for making the economic case for prevention. An ageing population means a rising disease burden and tight budgets that squeeze the ability to finance prevention. The consequence is a prioritisation of current ill health rather than future health, feeding the vicious circle of declining health, anaemic economic growth and growing pressure on health budgets.

Focusing only on the impact of treatments in terms of health risks overlooking the additional significant economic potential that prevention holds in enhancing GDP and generating additional resources for future health investments. Motivated by this idea, the point of this paper is not to advocate a set of specific preventative policies but to show how to develop tools to better integrate health policy into macroeconomic frameworks, quantify GDP improvements from prevention efforts and transform a negative economic cycle into a positive one.

To do so we need to construct a novel macroeconomic model combining i) evidence about how clinical interventions affect health outcomes with ii) empirical evidence about how health affects individuals' employment status, and with iii) a detailed focus on the age structure of the population so as to quantify the impact of various health interventions on future GDP and public finances. Using this model, we show that quantitatively plausible reductions in health outcomes lead to substantial macroeconomic benefits.

As well as quantifying the macroeconomic impact of prevention, this approach helps illuminate why prevention has such large potential economic benefits. Preventative-health measures are effectively an investment – an action now that leads to better later outcomes.

Consider the case of CVD. There is a growing awareness that damage to arteries begins in childhood and progresses silently over decades before leading to heart attacks and strokes. Managing this with late treatments, such as bypass surgery and stenting, is akin to starting to save for retirement in your 60s. Just as financial planners advocate harnessing the power of compound interest by saving early, so too do those who advocate a preventative approach to health care.

Allowing for this compounding effect is key to understanding the case for prevention – both in health and macroeconomic terms. Using our macroeconomic model to analyse this compounding effect reveals that there

are significant gains to GDP that can accrue from prevention even within a parliamentary term. That is the good news. The problem is that fully exploiting the gains from prevention require going beyond the current five-year fiscal framework. Prevention delivers sizeable, short-term benefits, but to capture the full gains we need to invest more in our future.

In addition to this compounding effect, our modelling highlights a second crucial insight essential for making the case for prevention. That is a limited number of common, potentially modifiable risk factors – such as smoking, high blood pressure, cholesterol, or having overweight or obesity – lead to multiple diseases of ageing, including diabetes, dementia, kidney disease and cancer. This implies a small number of interventions can potentially impact a larger number of later diseases. A health system focused on disease, in which each illness requires its own treatment, is very expensive, especially with an ageing population and a growing proportion of people with multi-morbidities. But if prevention can focus on a few risk factors and leverage this impact across multiple diseases, the returns on investment are high in both health and macroeconomic terms.

It is this aspect of prevention that is behind the tremendous excitement around new classes of drugs, such as glucagon-like peptide-1 receptor agonists (GLP-1 RAs), which are aimed at weight management and obesity. These have recently been shown not only to reduce weight in a sustainable manner, but also to lower the incidence of heart and kidney disease in patients. It is early days in the use and development of these drugs, but they point the way to a future of prevention in which a focus on a key biomarker can allow early intervention that prevents multiple later diseases and a shift from intervening late in life in response to severe illness towards helping the young remain healthy for as long as possible.

Prevention therefore holds great promise for both health and the economy. With the appropriate allocation of resources for prevention, the UK, and indeed other countries, can escape the vicious circle of increasing expenditure and worsening health that contributes to a stalling economy. The economic benefits of shifting expenditure towards maintaining health can unlock the resources a 21st-century health system requires. It is time for a change.

## 03

## The GDP Benefits of Prevention

If the case for prevention is to be made based entirely on its impact within the health system, there are two forms of arguments that can be made. The first is that preventative measures could be assessed as “cost effective”. For instance, according to the UK’s National Institute for Health and Care Excellence (NICE), a treatment that improves health at a cost of less than £20,000 to £30,000 per QALY<sup>6</sup> is cost effective and worth implementing. A second justification is that spending money on prevention might end up saving money overall. As with the old aphorism “a stitch in time saves nine”, prevention may keep people healthy and so avoid later costly expenditure. For example, statins are cheap and effective in reducing the incidence of CVD events, and in lowering future expenditure on costly heart operations. In this way, prevention can free up resources from within the existing health budget.

While both approaches are valid, they are limiting. First, QALYs consider only health outcomes and do not take into account the fact that different treatments may have different outcomes in terms of employment and hence GDP and public finances. Second, focusing on cost savings is important but it is unlikely that the majority of preventative treatments will be entirely self-financing in this way.<sup>7</sup> Both approaches, therefore, lead to an underestimate of the return on investing in preventative measures. The full case for prevention requires going beyond the impact that any particular measure might have within the health system alone.

That a significant link exists between health and the economy is obvious in Figure 2, which shows how health impacts the probability of moving between health, employment and inactivity for individuals aged between 50 and 64. A healthy older worker has a 5 per cent probability of leaving employment within a given year. But that jumps to more than 13 per cent if they receive a CVD diagnosis, 17 per cent in the case of a cancer diagnosis and 23 per cent with a stroke. Correspondingly, the likelihood of someone who is economically inactive becoming employed is two to three times greater if they are in good health.

FIGURE 2

## Employment transitions by health status



Source: UK Household Longitudinal Study (UKHLS) for survey years 2009 through 2019. Data derived from survey participants aged 50 to 64.

Figure 2 demonstrates the existence of a link between health and the likelihood of someone remaining in the labour force and contributing to the UK's GDP. To make the economic case for prevention, we need to show that this link is quantitatively significant. To do so, we developed a simple macroeconomic model that integrates clinical data on disease prevention with individual-level employment statistics to quantify how disease prevention could affect the UK's GDP and government finances.<sup>8</sup> Given the rising importance of the health-wealth nexus in an ageing society, it will be increasingly important in the coming years to develop such models and to utilise ever larger health data sets (such as the UK's Our Future Healthproject<sup>9</sup>). These efforts will help inform the allocation of health expenditure to maximise its impact on both health and the economy.

In our model, GDP growth dynamics are determined by the interplay of advancing technology, variations in physical-capital accumulation (such as

machinery, buildings and infrastructure), and changes in the labour force. The model accounts for projected changes in the population's age structure and features age-dependent labour-force participation and productivity. It calibrates labour-force participation by age using the ONS Labour Force Survey (LFS) and we rely on the UK Household Longitudinal Study (UKHLS) to estimate how disease events such as stroke or heart attack affect the likelihood with which workers transition between employed, unemployed and economically inactive states. In the model, productivity by age follows a hump shape, peaking in the mid-40s.<sup>10</sup> Using this model, we can track how changes in disease incidence lead to changes in the overall population size, the age distribution of the population and the relative likelihood of being in the labour force at each age. These shifts in the labour force across age groups in turn impact GDP and public finances, influencing both tax collection and social spending on health and employment benefits.

A full model exploring the interrelationships between health and GDP would require the inclusion of multiple channels – specific mechanisms through which economic activities, policies or events influence the broader economy – because increases in health and life expectancy have consequences for education, health behaviours, retirement age, innovation, investment and so on. We leave the exploration of these additional channels for future research. Our research focused only on the following direct channels through which improving health impacts the economy:

- **Increased population** – Better health leads to fewer people dying prematurely and a larger population, which in turn leads to higher employment, given constant labour-force participation rates.
- **Increased likelihood of being in work** – Improved health leads to an increase in labour-force participation rates at all ages.
- **Increased average hours worked** – Better health increases the likelihood of an individual working full time rather than part time.
- **Improved chances of returning to work** – Individuals who are economically inactive are more likely to find work if they are in good health.
- **Strengthened public finances** – Higher employment leads to higher tax revenues and lower benefit payments.

There are additional channels through which improvements in health could positively impact the economy. For instance, keeping more people in work will increase demand across various sectors, thereby providing an additional

boost to GDP. Similarly, the net fiscal benefit from higher tax revenues and lower benefit payments could be re-invested by the government, giving rise to a fiscal multiplier effect. Incorporating these additional channels could in effect double our findings in terms of the impact on GDP.<sup>11</sup>

However, where possible we focused on the direct links between health and the macroeconomy that emerged from our model. Our aim was to illuminate the key mechanisms through which improved health boosts the economy rather than build in multiple indirect channels that are not to do with health per se.

### **EFFECTS OF REDUCING DISEASE INCIDENCE ON GDP**

As a first effort to gauge the potential for prevention to boost GDP, we used our model to consider a hypothetical improved-health scenario in which the incidence of the six disease categories that are the leading causes of people being out of work due to ill health according to the Department of Work and Pensions – cancer, CVD, chronic respiratory illness, diabetes, and mental-health and musculoskeletal disorders – is reduced by 20 per cent over three parliamentary terms starting in 2025.<sup>12</sup> For the purpose of this paper, we refer to this as the improved-health scenario.

The main purpose of this exercise was to gauge the importance of health on GDP as well as to assess which diseases would be most important to focus on from a macroeconomic point of view. The plausibility of achieving a 20 per cent reduction in incidence varies across the six disease categories. For instance, achieving a 20 per cent reduction in CVD is well within the bounds of what is possible based on clinical evidence. For other disease categories, such as mental health, such reductions might be feasible but more innovation around prevention is needed.

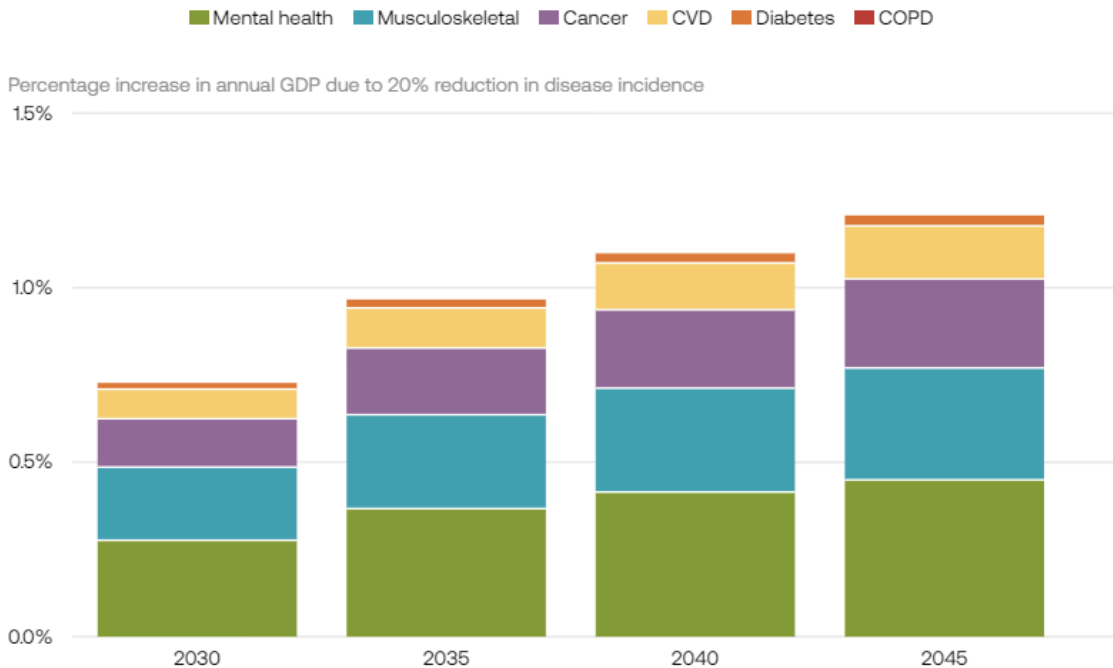
Our focus in this study is on prevention and so we modelled a reduction in incidence rates (new diagnosis of a disease) rather than prevalence (the total number of outstanding cases of a disease). The impact we found would have been much larger if we assumed a reduction in the number of people who are currently ill. However, prevention works by reducing the number of people who become ill, so it takes time for reductions in incidence to feed through to reductions in prevalence. This is why the magnitude of our results accumulates across the years. Figure 2 also shows why a focus on prevention is important. The chance of someone who is employed remaining in

employment is much higher than the chance of someone out of the labour force getting a job. This means the economic impact of keeping the employed healthy is substantial.

FIGURE 3

## Impact of 20 per cent reduction in incidence rate of major disease categories on UK GDP

Note: Figures in parentheses represent the projected annual increase in UK GDP (in billions of pounds sterling, at 2023 prices) under the improved-health scenario.



Source: Yannick Schindler and Andrew Scott (2024) [Forthcoming], "The Macroeconomic Impact of Chronic Illness in the United Kingdom".

Our results are shown in Figure 3 and reveal that the potential direct macroeconomic benefits to the UK economy associated with improving health are sizeable, increasing GDP by nearly three-quarters of a percentage point by 2030, the equivalent of nearly £20 billion at 2023 prices. This impact on GDP accumulates over time, reaching nearly 1 per cent by 2035 and continuing to grow thereafter. In terms of the relative contribution from reducing the incidence of each disease, the most important drivers are improvements in

musculoskeletal and mental-health disorders (just over half) with around one-third of the improvement due to reductions in cancer and CVD. The importance of these two categories is due both to the size of their incidence as well as their substantial impact on employment outcomes. It also points to the importance and urgency of developing interventions to tackle their rising incidence.<sup>13 14</sup>,

In terms of the main economic mechanisms behind our findings, the most important channel was better health keeping more people in work, which explained nearly two-thirds of the overall impact. Improvements in the likelihood of remaining in full-time employment explained a further quarter of the GDP gains by 2030. The remainder was explained by a larger population and shifts in the age structure. By far the most important factor was keeping people employed for longer rather than helping those out of the labour market return to work.

While the positive GDP effects accumulate over time, our model predicted the steepest increases in GDP would occur in the near term, with around 40 per cent of the full effect on GDP happening after five years (one parliamentary term), and after two terms this would increase to 60 per cent. The good news is that this suggests preventative measures have the capacity to yield quick returns. The bad news is that reaping the full benefits of preventative health is inconsistent with current fiscal rules, which require government debt to be falling as a percentage of GDP over a five-year period. A five-year timeframe is not long enough to capture the full macroeconomic benefits arising from improving health. This problem is made worse if we factor in the lags between implementing policy and rollout and impact.

Our analysis therefore has two strong conclusions. The first is that it is possible that preventative measures can be adopted without risking medium-term debt targets. The second is that these medium-term debt targets will rule out some preventative-health measures, which would be to the detriment of both the nation's health and the economy.

In our improved-health scenario, reduced disease incidence translates to fewer workers switching from employment into economic inactivity. The resulting increase in employment would mean the government would collect more taxes and make fewer ill-health-related benefit payments. Figure 4 shows the direct impact of this on public finances. We calculated these fiscal impacts using a set of Office for Budget Responsibility (OBR) ready

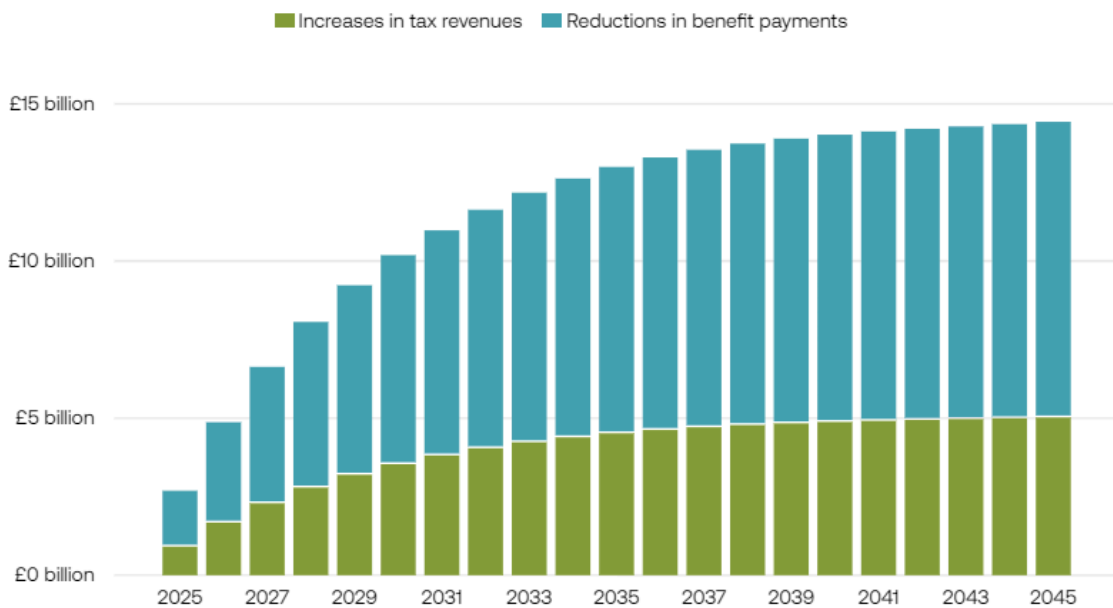


reckoners,<sup>15</sup> which quantify how preventing economic inactivity results in increased tax revenues and reduced benefit payments. Within the first year of our improved-health scenario, the impact on taxes and benefits would improve the borrowing requirement by £2.7 billion. By 2030 the cumulative impact is estimated at £41.7 billion.

Beyond the GDP and fiscal benefits, our analysis also revealed significant potential cost savings for the National Health Service (NHS) through disease prevention. In our improved-health scenario, our model indicates potential annual NHS cost savings would reach £692 million by 2030. Cumulatively this would lower government debt by a further £2.83 billion.<sup>16</sup> These figures not only represent a significant easing of financial pressure on the NHS but also highlight the potential for a virtuous cycle whereby savings from prevention can be invested back into further preventative measures and overall health-system improvements.

FIGURE 4

## Annual improvement in tax revenue and benefits from improvements in health (£ billion)



Source: Yannick Schindler and Andrew Scott (2024) [Forthcoming], "The Macroeconomic Impact of Chronic Illness in the United Kingdom"; OBR ready reckoners

### HEALTH AND DISTRIBUTIONAL ISSUES

While our focus has been on demonstrating the macroeconomic benefits of prevention it is crucial to acknowledge that health improvements hold intrinsic value beyond economic impact alone. We are arguing that the UK should integrate both health and economic criteria when assessing the impact of interventions rather than basing decisions on one or the other.<sup>17</sup>

We estimate that our improved-health scenario – a 20 per cent reduction across the six disease categories that contribute most to working-age adults leaving employment due to ill health, as described earlier – would result in an increase in life expectancy of one year and an improvement in healthy life expectancy of two years. The fact that healthy life expectancy increases more than life expectancy means that these policies lead to a compression of morbidity. This is another major goal for prevention. Focusing on treating

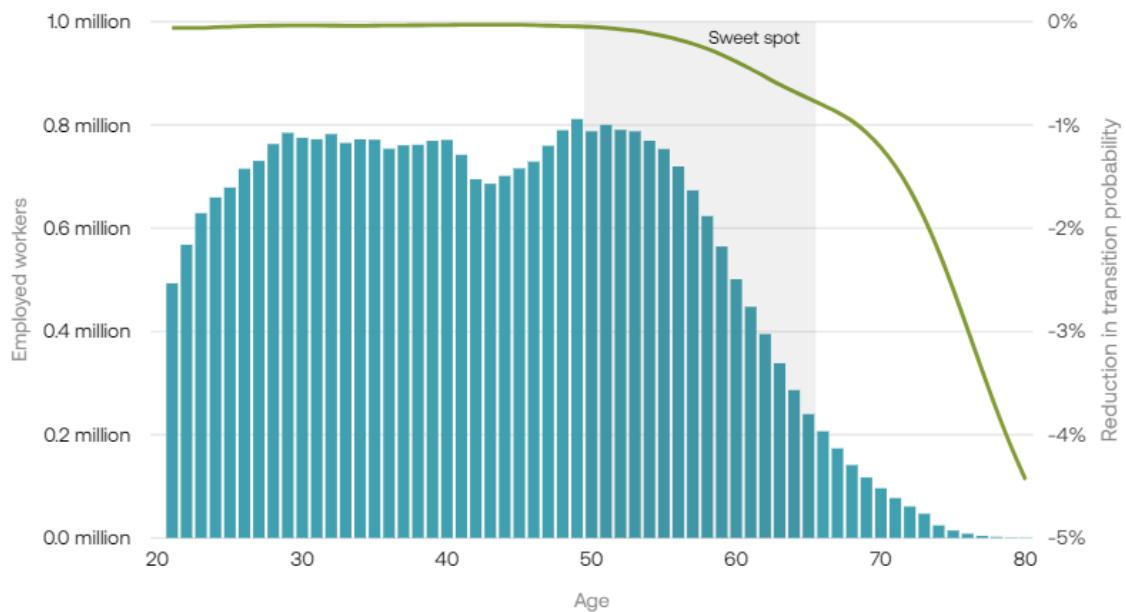
diseases tends to increase life expectancy but does not change how people age. Health advancements have slowed the dying process but not the ageing process. This compression of morbidity is an invaluable contribution to individual and societal wellbeing. It is not just about the ageing process, but the consequences of established yet potentially preventable diseases such as stroke, heart failure and dementia.<sup>18</sup>

Reducing the incidence of the six diseases included in our improved-health scenario would also contribute to a reduction in health inequalities. Compared to the top two income deciles, someone in the bottom two income deciles is 12 per cent more likely to contract cancer, 31 per cent more likely to experience a CVD event, 24 per cent more likely to have type-2 diabetes, 45 per cent more likely to suffer from poor mental health and 69 per cent more likely to experience a musculoskeletal disorder. Reducing disease incidence for mental-health and musculoskeletal disorders would not only give a boost to GDP but also go some way to narrow the health gap observed along the socioeconomic gradient.

In our improved-health scenario, the reduction in the incidence of six diseases would impact different age groups differently. Our analysis reveals a sweet spot for maximum impact on GDP by implementing preventative-health measures for those between the ages of 50 and 65. As shown in Figure 5, this group includes a large number of people who stand to benefit from improved health, and improvements in health have a large effect on the probability of staying in work. Among those aged under 50 there are more people in work, but the impact of disease reduction is small as incidence rates are lower. Among those aged over 65 the impact of disease reduction is greater because this group has relatively higher incidence rates, but the relatively low rate of labour-force participation reduces the economic impact of these health improvements. Therefore, it is workers aged 50 to 65 where the biggest economic gains come from staying disease-risk free as a result of preventative-health measures.

FIGURE 5

## The “sweet spot” where interventions have high impact on a large number of workers



Source: Authors' calculations based on Yannick Schindler and Andrew Scott (2024) [Forthcoming], "The Macroeconomic Impact of Chronic Illness in the United Kingdom".

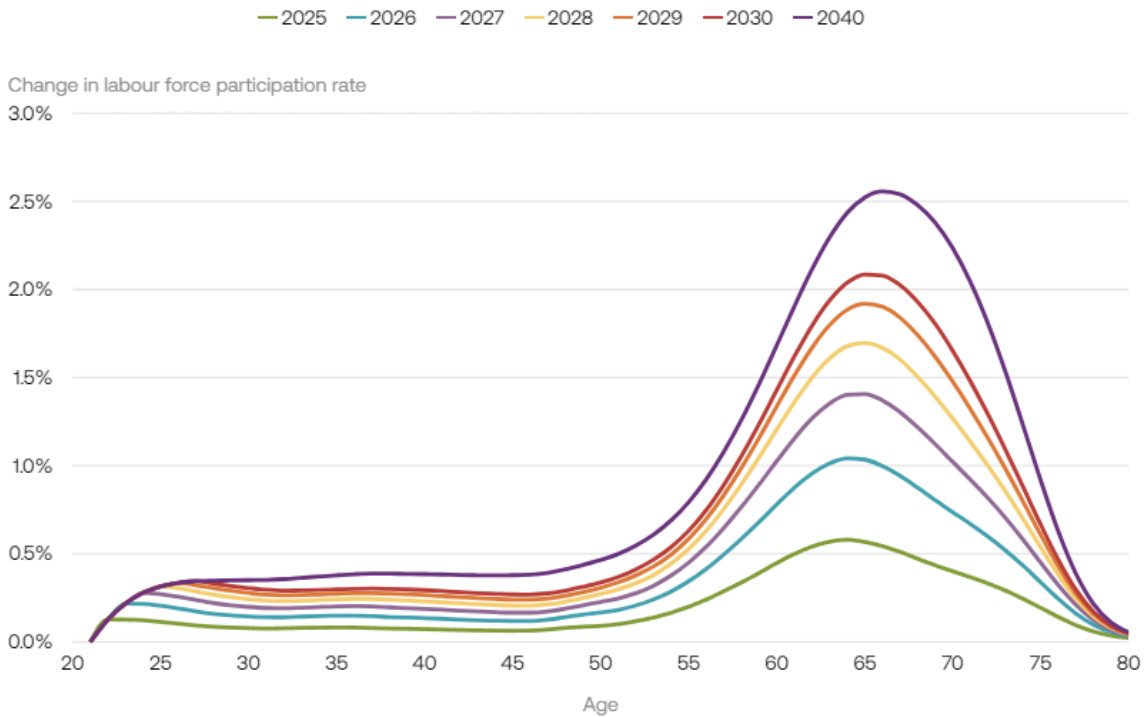
At first glance, this result may suggest that preventative measures should be targeted at those aged between 50 and 65. However, this interpretation misunderstands how prevention works and how health benefits compound over time. CVD, for instance, begins in childhood and progresses to an irreversible state, leading to clinical events in individuals aged 50 and above. The true preventive gain is achieved by avoiding disease development through much earlier intervention. Figure 5 demonstrates that a 60-year-old in 2025 is 0.6 percent more likely to be in work at age 61 due to a 20 per cent reduction in disease incidence in that year. This reduction increases the probability of everyone remaining in work longer, with a relatively large effect on 60-year-olds. The likelihood of staying employed also rises for 30-year-olds, creating a larger pool of employed individuals aged 31 one year later. This group continues to benefit from the 20 per cent reduction in incidence at that age, further boosting workforce numbers at age 32 in two years' time, with the

pattern continuing year after year.

This compounding effect significantly extends the duration someone remains employed without being forced into inactivity due to poor health. Our model predicts that in 15 years, a 45-year-old today would have a 2.8 per cent higher chance of being employed at age 60 compared to a 60-year-old today. Refocusing health care with a greater emphasis on prevention reorients the agenda towards the younger working population, with both health maintenance and economic productivity as metrics of success.

FIGURE 6

## The compounding effect of preventative health



Source: Yannick Schindler and Andrew Scott (2024) [Forthcoming], "The Macroeconomic Impact of Chronic Illness in the United Kingdom".

### EVALUATING PREVENTATIVE MEASURES

The analysis above examined the significant economic gains that could arise from a hypothetical reduction in the incidence of six major disease categories. The results reveal that GDP gains would be substantial and that a significant

proportion of them would occur within the medium term, although a longer horizon would be required to see the full benefits. The next question is whether a reduction in incidence of 20 per cent is a plausible target. For some diseases the answer is yes. We now turn to consider in more detail the impact of particular treatments based on clinical evidence.

CVD accounts for around 25 per cent of all deaths in the UK. It is also a disease that has several proven clinical treatments to help substantially reduce its prevalence. One such treatment is the use of statins, taken to reduce elevated low-density lipoprotein (LDL) cholesterol levels, a causal risk factor for CVD. Statins are highly effective both clinically and in terms of cost: a 1 millimole reduction in LDL cholesterol leads to a 20 per cent reduction in the rate of CVD.<sup>19</sup>

We can integrate clinical estimates of how reductions in cholesterol – taking into account the amount, duration and timing – translate into lower disease incidence with our economic model to estimate the potential impact on employment and GDP, although in reality early versus late cholesterol reductions can have different impacts on disease incidence. This is a modified version of our improved-health scenario in the previous chapter. Here the focus is just on CVD and we use clinical evidence on lags between changing a biomarker (cholesterol) and subsequent impact on the disease. Evaluating a particular programme would require making additional assumptions about rollout capacity, non-compliance and coverage, but using these clinical results in this way gives us an upper bound for what a well-designed and executed prevention programme can achieve.

Our model suggests that these measures could increase annual GDP by 0.08 per cent in 2030 (£2.2 billion), 0.11 per cent in 2035 (£3.0 billion), and 0.13 per cent in 2040 (£3.5 billion). That is equivalent to an extra 15,000 workers (0.05 per cent of the workforce) by 2025 and more than 50,000 in 2030 (0.16 per cent). Using the OBR ready reckoner, that translates into a reduction in the government's annual net cash requirement of £0.5 billion in 2025 and £1.7 billion by 2030, and a reduction in government debt of £6 billion by 2030 and £30 billion by 2040.

These gains may appear small, but given the low cost of statins (approximately £150 million in 2021–2022<sup>20</sup>) relative to their health returns, they point to sizeable rates of return from investing in preventative health. Achieving more substantial economic gains from preventative-health policies will require

a range of such policies, with each contributing in relatively small ways but with their combined impact adding up to something far more substantial.

### **THE FULL CASE FOR PREVENTION**

While these quantitative evaluations are insightful we have still not fully articulated the case for prevention. We have so far been working within a disease paradigm where a particular intervention is aimed at a specific disease, that is to say lowering cholesterol to reduce CVD. The full case for prevention, however, requires moving beyond this framing of disease and understanding that there are four distinctive features about prevention that lead to large gains.

The first is that prevention focuses on causal factors and biomarkers rather than a disease. The idea is to keep people healthy, and that entails early detection and targeting measures to address issues that are predictive of later disease. For instance, in our cardiovascular example this was LDL cholesterol. As more progress is made in understanding the development of diseases, more biomarkers are likely to be identified. The potential to use large datasets such as Our Future Health or health data from wearables will over time leverage imaging, genomics, data and artificial intelligence to identify more key biomarkers that are predictive of later disease and recommend personalised strategies to address them.

The second key feature of prevention is the compounding effect we described earlier. If you keep people healthier earlier in life, the gains are magnified as they age. Given that ageing populations are a global phenomenon, it is increasingly important to age well, but that is achieved much more effectively if prevention is done before people become old. This compounding effect is why longitudinal engagement is an important aspect of prevention programmes. Such engagement allows for the analysis of trajectories of simple measures of health over time – and providing people with understandable feedback about risks and benefits empowers them to make informed health choices, maximising long-term health benefits.

The third key feature of prevention is that in many cases intervening on one biomarker reduces the incidence of multiple diseases. This is especially important given that with an ageing population the disease burden is shifting to ageing-related diseases such as cancer, cardiovascular disease, diabetes and dementia, with resulting co-morbidities. This feature therefore leads to

large economic gains because the impact of prevention accrues across multiple diseases, reducing the disease burden in aggregate.

The fourth key feature of prevention is linked to the third. Improvements in the quality of a person's life that arise from reducing CVD are restricted if their remaining years are affected by other diseases such as dementia. Likewise, even if dementia risk is reduced, a person's quality of life could be impaired by CVD. There is a synergistic effect when reducing the incidence of multiple diseases such that the overall value of the health gains is greater than the sum of addressing each disease in isolation.<sup>21</sup>

It is these last two properties – aggregation and complementarity – that underpin much of the recent excitement about the potential of GLP-1 RA drugs. These drugs target not only insulin secretion to help regulate blood-sugar levels but also influence metabolism, glucagon secretion and appetite, thereby promoting weight loss. Initial evidence suggests that these drugs do not only reduce obesity but also exert a potential influence on the incidence of a range of other diseases, with suggestions that they may have the potential to impact CVD, musculoskeletal disease, chronic kidney conditions and cancers. These drugs are still at an early stage and their long-term impact on multiple diseases is still a matter of conjecture. Their true potential as widespread prevention drugs is also yet unquantified given that the currently available data focus on those with pre-existing health conditions rather than the broader public.

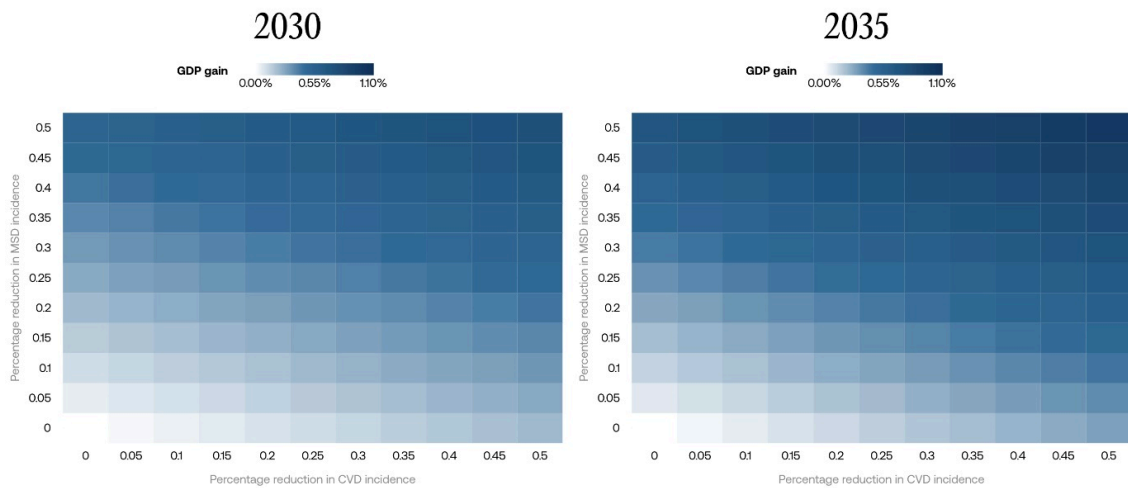
They do, however, point the way to a future where preventative drugs could open up the potential for substantial improvements in the incidence of multiple diseases. Motivated by this thought, we can use our model to illustrate the potential gains from treatments that impact the incidence of multiple diseases. For reasons of simplicity and motivated by GLP-1 RA therapeutics, we considered a treatment that impacts only two diseases – CVD and musculoskeletal conditions. We already have evidence that these drugs can influence cardiovascular outcomes<sup>22</sup> and there is a substantial body of literature linking reductions in obesity with improvements in musculoskeletal conditions. Making different assumptions about the reduction in incidence of each of these diseases, we can calculate the potential GDP gains that emerge from our model. The results are shown in Figure 7 for an impact after five years (2030) and 15 years (2040). We show the results for a variety of different changes in incidence as this is a hypothetical example



illustrating the potential scale of gains from preventative treatments that impact multiple diseases. If we allowed for an impact on more than two diseases, we would get even larger results.

FIGURE 7

## Possible GDP gains from preventative treatments that reduce incidence of CVD and musculoskeletal disorders (MSD)



Source: Authors' calculations

Once again, our main results hold. The gains from prevention are potentially substantial even when considered over a five-year horizon (a 20 per cent reduction in CVD and musculoskeletal disorders leads to a 0.3 per cent boost in GDP after five years), the magnitude of the gains increase over time (by 2030 only 50 per cent of the long-term benefits have been achieved) and impacting multiple diseases leads to larger economic gains. In the case of CVD and musculoskeletal disorders, note that there is an asymmetry, reflecting the results in Figure 3. Reductions in the incidence of musculoskeletal disorders have larger impacts than reducing the incidence of CVD.

These calculations using our model are illustrative and are inspired by the potential of preventative drugs that can impact a wide range of diseases, but

they echo the themes of this paper. Prevention works by focusing on health, not disease, and has the additional benefit of a sizeable impact on the economy by keeping people healthy so they can remain in work.

## 04

## Conclusions and Recommendations

This is a transformative moment for health care. Treating established diseases in later life is no longer scientifically justified or financially viable, rendering existing health systems unsustainable with acute problems already manifesting in the UK. To escape a cycle of declining health, weak economic growth and constrained health budgets, significant change is imperative. We urgently need to shift towards prevention.

This shift necessitates innovations in technologies and delivery methods as well as the evaluation of health expenditure. Currently, the case for prevention is hindered by a failure to recognise the broader connections between health and GDP.

Through modelling these connections, we demonstrate that prevention not only improves health outcomes and saves costs but also enhances GDP, employment and public finances. Initial estimates indicate substantial macroeconomic gains are achievable through prevention, accruing over both the medium and long term and so generating the resources needed to finance prevention.

Based on this analysis we recommend the following to the new government:

- **Focus on macroeconomic implications** – Prioritise understanding the macroeconomic implications of health-expenditure allocations, rather than just the total amount spent. Developing tools to analyse and optimise these allocations will be crucial.
- **Integrate health and economic targets** – Both economic and health ministries should set targets based on healthy life expectancy. This approach will help achieve better health outcomes and support employment, especially in the context of an ageing population.
- **Develop comprehensive fiscal frameworks** – To effectively shift to a prevention paradigm, governments must create fiscal frameworks that evaluate the full costs and benefits of preventative-health interventions. These frameworks should account for long-term impacts extending beyond the typical five-year fiscal period.

- **Create dedicated funding mechanisms** – Given the potential of preventative health care to generate additional resources, governments should explore establishing dedicated funding mechanisms, ring-fenced and outside current health budgets, to support preventative measures.

Our focus has been on the macroeconomic case for prevention rather than a specific delivery plan. However, recent innovations in prevention and digital technology make this shift both urgent and feasible. Digital platforms, data utilisation and AI enable programmes to screen patients, predict disease risk and deliver accessible therapeutics in settings like pharmacies, workplaces and community health hubs with minimal infrastructure and doctor involvement.

Existing components, such as the NHS Health Check, could support a comprehensive digital health and wellness service. This infrastructure would unite stakeholders from various sectors, fostering innovation and addressing gaps in the current system. A shift to prevention requires incentivising individuals, providers and businesses to invest in health through new partnerships and financial models, ushering in a public-health-focused era.

Prevention has the potential to improve not just aggregate outcomes but also to tackle rising inequalities, both in health and income. Any prevention programme should prioritise disadvantaged populations and areas with higher rates of long-term illness and inactivity from the outset. Given the need to trial many of the innovations discussed here, targeting those areas where health shortfalls are largest and the potential impact on the local economy greatest is a natural and urgent starting point.

At the heart of a shift to prevention is a move away from a system focused on treating disease towards one aimed at preserving health. The impact of the disease paradigm runs deep, and fully exploiting the scope for prevention involves not just an institutional shift but also a conceptual one. We have outlined a basic model that combines clinical data with individual employment outcomes and traces these through to macroeconomic outcomes. However, much work remains to develop this into a fully fledged model capable of addressing the complexity and nuance of the interactions between health and the economy, including far more focus on the empirical determinants of maintaining health rather than treating disease.

Key to this will be developing the data that provide detailed insight into how

health evolves and how this links causally with economic outcomes. By leveraging such individual-level data, prevention can offer the diagnostic tools necessary for personalised prevention, identify the most successful interventions for health, quantify their economic consequences and optimise funding for health care. The Our Future Health programme is a remarkable initiative aiming to recruit 5 million subjects into a long-term academic environment for these purposes. It should help make the UK a world-leading destination for testing and adopting life-science innovations for prevention.

The world has changed dramatically since the NHS was established. The UK has benefited enormously from a system that has provided universal health care and generated improvements in health and significant increases in life expectancy. As a result of that considerable success the NHS now faces new challenges. If the benefits of health expenditure are to continue to boost the economy, a shift to prevention is required. With an ageing population, the links between health and GDP growth become stronger. By shifting the focus to early intervention and leveraging technological advancements, the UK can address the challenges posed by chronic diseases, improve workforce participation and enhance overall economic productivity. This holistic approach will ensure that the health-care system evolves to meet current needs while contributing positively to the nation's GDP.

# 05

## Acknowledgements

The authors would like to thank all participants at the Health and GDP Modelling workshop in April 2024 and Jon Symonds.

# Endnotes

- 1 NHS Confederation, “Improving our Nation’s Health: A Whole-of-Government Approach to Tackling the Causes of Long-Term Sickness and Economic Inactivity” (2024). <https://www.nhsconfed.org/publications/improving-our-nations-health-whole-government-economic-inactivity>
- 2 The Resolution Foundation, “We’ve Only Just Begun” (2024). <https://www.resolutionfoundation.org/publications/weve-only-just-begun/>
- 3 Derek Wanless, “Securing our Future Health: Taking a Long-Term View” (2002) <https://www.yearofcare.co.uk/sites/default/files/images/Wanless.pdf>
- 4 Cathryn M Lewis and Evangelos Vassos, “Polygenic Risk Scores: From Research Tools to Clinical Instruments”, *Genome Medicine* 12, no. 1 (2020).
- 5 Andrea Campos-Carrillo et al, “Circulating Tumour DNA as an Early Cancer Detection Tool,” *Pharmacology and Therapeutics* 207 (2020): 107458.
- 6 NICE Health Technology Evaluations: The Manual (2023) <https://www.nice.org.uk/process/pmg36>
- 7 A 2008 estimate indicates only around 20 per cent of treatments fall into this category. <https://www.nejm.org/doi/full/10.1056/NEJMp0708558>
- 8 Yannick Schindler and Andrew Scott (2024) [Forthcoming], “The Macroeconomic Impact of Chronic Illness in the United Kingdom”.
- 9 <https://ourfuturehealth.org.uk/>
- 10 James J. Heckman, “Earnings Functions, Rates of Return and Treatment Effects: The Mincer Equation and Beyond”, *Handbook of the Economics of Education* 1 (2006): 307-458. (Whether this hump-shaped assumption is correct is debatable, see: Steven G. Allen, “Demand for Older Workers: What Do We Know? What Do We Need to Learn?”, *Journal of Economics of Ageing* 24 (2023): 100414). It is also likely that improvements in health would improve productivity, an effect our data does not enable us to estimate. If we were to remove this assumption or make productivity at higher years we would get even greater estimates of the benefits from prevention.
- 11 See for instance the approach of <https://www.nhsconfed.org/publications/improving-our-nations-health-whole-government-economic-inactivity>
- 12 By assuming an immediate reduction in incidence we avoid important modelling issues around implementation and roll out of new policies.
- 13 Isabelle Soerjomataram and Freddie Bray, “Planning for Tomorrow: Global Cancer Incidence and the Role of Prevention 2020–2070”, *Nature Reviews Clinical Oncology* 18 (2021): 663–672.
- 14 Kelvin Okoth et al. “Sex-Specific Temporal Trends in the Incidence and Prevalence of Cardiovascular Disease in Young Adults: A Population-Based Study Using UK Primary Care Data\_”, *European Journal of Preventive Cardiology*\_ 29, no. 10 (2022): 1387-1395.

- 15 <https://articles.obr.uk/the-obr-ready-reckoner/index.html>
- 16 The NHS cost-savings projections are derived from a combination of OBR estimates on NHS treatment costs for individuals with health-related economic inactivity and our model's predictions of improved workforce participation due to reduced disease incidence.
- 17 Kevin M. Murphy and Robert H. Topel, "The Value of Health and Longevity", *Journal of Political Economy* 114, no. 5 (2006): 871-904.
- 18 Andrew J. Scott, Martin Ellison and David A. Sinclair, "The Economic Value of Targeting Ageing", *Nature Ageing* 1 no. 7 (2021): 616-623.
- 19 Cholesterol Treatment Trialists' (CTT) Collaboration; Mihaylova B et al., "The Effects of Lowering LDL Cholesterol with Statin Therapy in People at Low Risk of Vascular Disease: Meta-Analysis of Individual Data from 27 Randomised Trials", *The Lancet* 380 no. 9841 (2012): 581-590.
- 20 NHS Business Services Authority, Prescription Cost Analysis. <https://www.nhsbsa.nhs.uk/statistical-collections/prescription-cost-analysis-england/prescription-cost-analysis-england-2021-22>
- 21 Kevin M. Murphy and Robert H. Topel, "The Value of Health and Longevity", *Journal of Political Economy* 114, no. 5 (2006): 871-904.
- 22 Lucas Marques Fortunato et al., "Relationship Between Obesity and Musculoskeletal Disorders: Systematic Review and Meta-Analysis", *Research, Society and Development* 10, no. 13 (2021): e11910132021.



## Follow us

[facebook.com/instituteglobal](https://facebook.com/instituteglobal)

[twitter.com/instituteGC](https://twitter.com/instituteGC)

[instagram.com/institutegc](https://instagram.com/institutegc)

## General enquiries

[info@institute.global](mailto:info@institute.global)

Copyright © July 2024 by the Tony Blair Institute for Global Change

All rights reserved. Citation, reproduction and or translation of this publication, in whole or in part, for educational or other non-commercial purposes is authorised provided the source is fully acknowledged Tony Blair Institute, trading as Tony Blair Institute for Global Change, is a company limited by guarantee registered in England and Wales (registered company number: 10505963) whose registered office is One Bartholomew Close, London, EC1A 7BL.