

Beyond genomics: Unlocking the full potential of Our Future Health

Over 2 million people in the UK have signed up to take part in Our Future Health, making it the world's largest source of longitudinal health data, enabling disease prevention, drug discovery and supporting economic growth.



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Tackling growing challenges in healthcare: a prevention approach

The UK, like many countries globally, faces an increasing burden from treating late-stage chronic disease and growing numbers of cases of multimorbidity in the population, with two-thirds of adults aged over 65 years expected to be living with multimorbidity by 2035¹. Alongside increasing multimorbidity and slowing gains in life expectancy, increasing disparities in health create new challenges to healthcare infrastructure. Non-communicable diseases such as cardiovascular disease (CVD), cancers and diabetes continue to cause the highest burden of mortality and morbidity globally². However, many of these diseases are preventable through reducing major risk factors like tobacco use, physical inactivity, unhealthy diet and the harmful use of alcohol.

Focusing on prevention provides a clear pathway to breaking this cycle. However, preventative health care programmes struggle to attract funding, as their long-term macroeconomic impacts bear limited weight in the allocation of expenditure. Estimates suggest that a 20% reduction in the six main causes of long-term illness keeping people out of work – cancer, cardiovascular disease, chronic respiratory illness, diabetes, mental health and musculoskeletal disorders – could raise gross domestic product (GDP) by an estimated 0.74% within five years, or £19.8 billion per year³. Increased tax revenues and reduced benefits payment from people returning to work could amount to a further £10.2 billion by 2030³.

Our Future Health, a longitudinal research study that opened for recruitment in October 2022, has been

established to help everyone live longer and healthier lives through the discovery and testing of more effective approaches to prevention, earlier detection and treatment of diseases. The programme supports the government's commitment to improving the health of the nation through a more predictive, preventative and personalised system, and builds on the strong legacy of research infrastructure in the UK⁴.

Recruiting faster than any study at this scale before, the study aims to recruit 5 million participants. 2.3 million participants have already consented to join the study, and 1.7 million participants have completed the short lifestyle and health questionnaire, with 1.3 million providing blood samples and physical measurements. This detailed health and lifestyle information is further enhanced through direct linkage to hospital records, cancer registries, death registration and consent to link to primary care records, making Our Future Health a powerful tool for conducting novel research to facilitate new healthcare discoveries and inform health and social care policy. The programme will also support the enrolment of participants into future studies, speeding up recruitment to clinical trials, and due to its scale, enabling research on rare diseases where other datasets fall short. Evaluations of the effectiveness of returning personalised disease risk estimates based on genetic and lifestyle information will enable Our Future Health to generate an evidence base that will support improvements in the health and wellbeing of the UK population.



Prevention: a key for economic growth

Lord Darzi's Independent investigation of the NHS in England highlighted a growing challenge to the UK government and the NHS: 2.8 million people were economically inactive due to long-term sickness as of the start of 2024, an 800,000 person increase on pre-pandemic levels⁵. Trends show that those who leave the workforce due to long-term ill-health are unlikely to return to work, reducing the population participating in the labour market and increasing those seeking universal credit. In addition to this, the rising State Pension Age risks pushing more

unemployed people into poverty and exacerbating ill-health⁶.

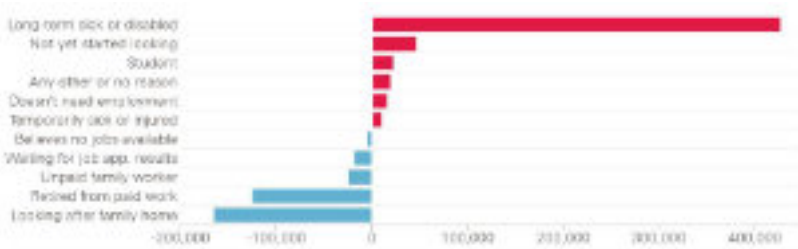
The relationship between incomes, health, and life-expectancy is not linear. As income rises, life expectancy increases; however, the relationship weakens as income rises, suggesting that those on lowest incomes have most to gain in returns on life expectancy from health investment (see Figure 2)^{7,8,9}

Analyses undertaken on behalf of NHS Confederation investigating the direct relationship between NHS spend and economic output found that "growth in healthcare investment has a clear relationship with economic growth" concluding that every £1 invested in the

NHS translates into an overall economic return of £4 in the local area¹⁰.

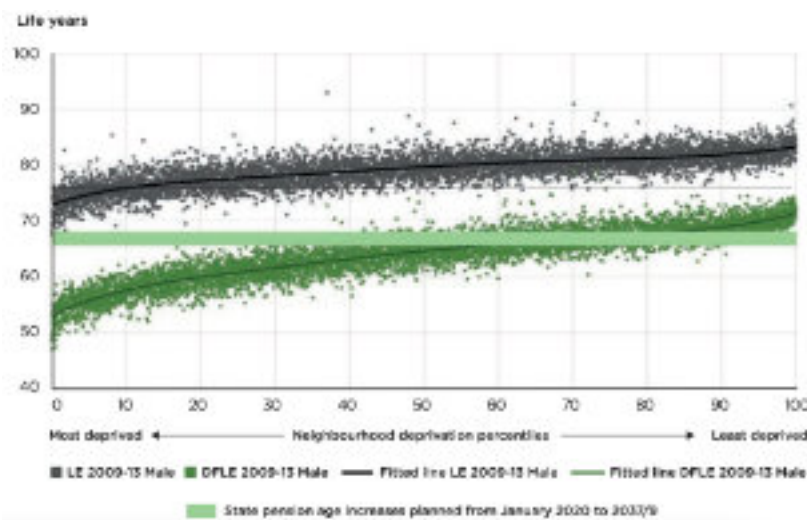
With the largest cohort of young people aged 18–40 years (over 200,000) and working age populations (over 750,000) of any study to date, Our Future Health can facilitate research into diseases disproportionately affecting younger people and their ability to work, including their long-term follow-up. We have the largest ever number of participants from under-represented groups in a health research programme, with 12% of participants joining from the most deprived quintile of the population. 14% of participants are from ethnic minorities, making Our Future Health the largest multi-ethnic cohort in the UK.

Figure 1: Change in number of people aged 16–65 who are economically inactive by reason: UK, Q1 2020–Q1 2023.



Source: Health Foundation (2023)⁶

Figure 2: Life expectancy at birth (in males) by neighbourhood deprivation percentiles, 2009–13, England



Adapted from: Marmot M et al (2020)⁹

Note: Each dot represents life expectancy (LE) or disability-free life expectancy (DFLE) of a neighbourhood (middle level super output area).

We can provide the insights and evidence for service improvements and distribution, enabling the identification of high-risk populations. For example, data from volunteers of working age (18 to 66 years inclusive) reveals that 14.6% of people who have had a diagnosis of heart attack or stroke are unable to work because of sickness or disability, compared with rates of 2.9% for the whole cohort. Data such as this could be used to improve or target services and programmes to those most in need.

Enabling a personalised approach to healthcare

As demand on NHS services continues to increase alongside growing rates of non-communicable diseases, a preventative and personalised approach to care must be adopted. Motivating and equipping patients with the knowledge and tools to improve their long-term health outcomes is essential. Our Future Health has committed to providing personal disease risk information to participants who wish to receive it. Some risk prediction tools are already recommended in clinical guidelines, however there is more work to be done to support their routine integration and utilisation in clinical pathways as well as their widespread adoption by both the public and clinicians¹¹.

By enabling all participants (but especially younger working adults) to understand their risk of future disease and how to reduce such risk, it may be possible to generate evidence for policies and



interventions that could reduce the incidence of early-onset long-term illness leading to premature departures from the workforce. There is evidence to suggest that providing the public with early personal risk information is cost effective. The NHS Health Check (which includes the calculation of CVD risk) has already demonstrated a return on investment (ROI) of £2.93 per £1 spent¹². Our Future Health is already positioned to take the pulse of the health of the UK population, as well as provide insights and an evidence base into effective interventions that will improve the health of the UK population, and as a result, the economy. We can help the government better understand barriers to good health, the intersection between health and the economy, and geographical areas in which actions can have real benefits.

Conclusions

Our Future Health is already open to researchers. Harnessing the power of our large-scale data could revolutionise the UK's approach to the health and wellbeing of its citizens. In 2024, the government delivered a request to the nation to help build a health service fit for the future¹³. We plan to support this effort by providing tailored products to support the work of Public Health and Government. Our Future Health offers a unique opportunity to build an evidence base supporting the prevention, early

detection and improved treatment of disease at a national scale.

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